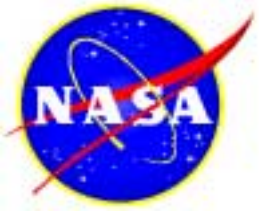
NOVEMBER 2000



National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058

HRF Flight Rack One Integration Test Procedure I: Rack Handling and Processing

LS-71139-1A

PROJECT DOCUMENT APPROVAL SHEET		
DOCUMENT NUMBER LS-71139-1A	**DATE** 11/15/00	**NO. OF PAGES** 69

HRF Flight Rack One
Test Procedure I:
Rack Handling and Processing

Approved: _____ _____
Ed Strong — Date
NASA/EA5 HRF Rack Integration Manager

Approved: _____ _____
NT3/GFE Assurance Branch — Date

DATE	PREPARED BY	CHANGE APPROVALS	CHANGE NUMBER

Report Number LS-71139-1A **Date:** 11/15/00

HRF Flight Rack One
Test Procedure I:
Rack Handling and Processing

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Johnson Space Center

REVISION/CHANGE APPROVALS

Date	Revision Letter	Change Number	Prepared By	Approved By:	
				Unit Manager	Projects Manager

DOCUMENT NUMBER LS-71139-1A	**DOCUMENT CHANGE/ REVISION LOG**	PAGE 1 OF 1

CHANGE/ REVISION	DATE	DESCRIPTION OF CHANGE	PAGES AFFECTED
BASIC	8/99	Baseline Issue	ALL
Rev A	11/00	Changes made due to redlines encountered during realtime operations and to incorporate deviations sheets.	Pgs. I, ii, 4-1, 6-1 thru 6-19, A-10, A-11

Altered pages must be typed and distributed for insertion.

JSC FORM 276 (REV APR 81)

ABSTRACT

This document provides the Rack Handling and Processing Procedure for the Human Research Facility (HRF) Flight Rack. The procedure facilitates the pre and post-transportation activities involving the rack shipping container and rack handling adapter.

The primary purpose of the Rack Handling and Processing Procedure is to outline the steps necessary for successful integration of the HRF Flight Rack into a test facility. The Rack Handling and Processing Procedure will be conducted in Building 241 Payload Rack Check-out Unit (PRCU) test environment at the Johnson Space Center, Houston, Texas. A step-by-step sequence of activities to be conducted is included in Section 6.0 of this procedure.

A Test Readiness Review (TRR) will be held prior to the start of this activity. The TRR Board, Quality Engineering, and the Payload Test Conductor will agree to proceed with the individual tests listed in this document.

KEY WORDS

Human Research Facility
International Space Station Program

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LIST OF ACRONYMS AND ABBREVIATIONS

C&DH	Command & Data Handling
DR	Discrepancy Report
EXPRESS	Expedite the Processing of Experiments to Space Station
FOD	Foreign Object Damage
GSE	Ground Support Equipment
HRF	Human Research Facility
ISPR	International Standard Payload Rack
ITCS	Internal Thermal Control System
JSC	Johnson Space Center
KSC	Kennedy Space Center
MEIT	Multiple Element Integrated Test
MSFC	Marshall Space Flight Center
MTCL	Moderate Temperature Control Loop
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
Ohm	Unit of Electrical Resistance
PRCU	Payload Rack Check-out Unit
QASOP	Quality Assurance Safety Operating Procedure
RHA	Rack Handling Adapter
RSC	Rack Shipping Container
TPS	Task Performance Sheet
TRR	Test Readiness Review
VRDS	Verification Requirements Data Sheet

1.0 INTRODUCTION

1.1 PURPOSE

This document outlines the procedures necessary to transfer the HRF Flight Rack into the Building 241 PRCU verification test facility, and establish the baseline operating procedures to be used during fluid sampling. The expected end product of this activity is the successful integration of the HRF Flight Rack into the PRCU test facility. The only integrated function this document addresses is the initial fluid sampling from the HRF Rack.

1.2 SCOPE

This document provides task sequencing to satisfy the test requirements as detailed in the document “Rack One HRF Unique Payload Verification Plan” is SSP-574000, “Human Research Facility Unique Payload Verification Plan for Rack 1, International Space Program”. The details listed herein describe the necessary hardware, configuration, test equipment set-ups, instrumentation requirements, data requirements, safety concerns, and all other details necessary to perform the appropriate procedure.

This procedure is applicable to the subsystems and components of the HRF Flight Rack. It encompasses the initial Facility Integration of the payload rack, along with the fluid sampling to be performed by Lockheed Martin HRF personnel, and other agencies described herein.

1.3 DOCUMENT OVERVIEW

This document details the test setup, tear down, and procedures divided into five (5) sections:

Section 6.1	REQUIRED EQUIPMENT
Section 6.2	RACK SHIPPING CONTAINER (RSC) FORKLIFT UNLOADING
Section 6.3	RACK UNPACKING
Section 6.4	RACK/INTERNAL THERMAL CONTROL SYSTEM (ITCS) WATER COOLING SAMPLING
Section 6.5	RACK PACKING

1.3.1 Document Hand-Write Change Control

This document is designed to present baseline procedures for rack handling and fluid sampling. It is therefore assumed that this document is subject to hand-write changes while in use in the test area. Hand-write entries will be controlled and documented in this procedure. All hand-writes must be approved by Quality Engineering and the Test Conductor prior to implementation. Quality Assurance will validate all hand-writes. If safety is affected, then Safety Personnel must also approve changes. The personnel that have
Task Performance Sheet (TPS) signature authority are authorized to make hand-write changes to this document. Hand-written changes to this document will be done using deviation sheets (See Appendix A). This document will be revised to include permanent hand write changes.

1.3.2 Warnings And Cautions

Prior to performing any operation, test personnel must be familiar with all "General Notes, Warnings, Cautions, Special Instructions and Safety Precautions" contained in the reference documents and drawings unless otherwise specified within this procedure.

1.3.3 Task Sequencing

The procedures outlined in this document are written to ensure technical completion of a specified task and are not necessarily sequenced to provide optimum crew/tool equipment utilization or rack build-up. The work is to be accomplished sequentially, unless it is more efficient to parallel the operations. The responsible Test Conductor must first evaluate any change to assure that there is no degradation of technical requirements, system safety, personnel safety, scheduling, etc. The responsible Test Conductor may give verbal authorization to perform steps non-sequentially. Sequencing changes require concurrence from Quality Assurance.

1.3.4 Repeat Operations

Prior to proceeding, operations that must be repeated require approval of the Test Conductor and Quality Assurance. All repetitive operations must be documented in the Repetitive Operations Log in Appendix A.

1.3.5 Discrepancies

If any discrepancy occurs in the form of an equipment failure, hazard, or emergency, the personnel concerned will take appropriate action to ensure personnel and equipment safety, and report to a Quality Assurance

Specialist. The Test Conductor will notify the National Aeronautics and Space Administration (NASA) facility manager and act as focal point for any further effort required. If required, a Discrepancy Report (DR), Johnson Space Center (JSC) form 2176 will be initiated by Quality Assurance, and will be tracked and worked as described in document NT1-CWI-003 (See Appendix A).

1.3.6 Safety Support

JSC Safety & Health Requirements established in document JPG 1700.1 Version H, will be strictly adhered to throughout all phases of test activities. All hazardous activities will be coordinated with the appropriate facility personnel.

1.3.7 Emergency/Accident Procedure

The following procedures are to be used in the event of an emergency situation, (i.e. smoke or fire) or in the case of an accident involving personal injury.

Emergency procedures provide pre-planned and approved guidelines for handling potential hardware/software malfunctions and hazardous situations. If a hazardous situation occurs, the following definitions state the actions necessary to maintain control of the situation and personnel safety. Actions required for the situations not covered by these procedures shall be provided by the Test Conductor real-time, based on his/her best judgment.

Definitions

Abort Test: Take immediate and rapid actions for restoration of safe conditions removal or rescue of test personnel, notification of the appropriate personnel about the hazardous situation, and shutdown of all systems. This action is taken in catastrophic critical hazard conditions such as fire, smoke, or serious personnel injuries.

Terminate Test: Discontinue test per the standard shutdown procedures provided. This action is required when the situation prevents further compliance with the test objectives.

Hold and Evaluate: Maintain current test conditions or proceed to safe mode to allow time to review system status and impacts of the situation. This action is required in the event of a hardware/software malfunction.

Emergency Exits and Equipment

Figure 1-1 shows the emergency exits for personnel in the test area, and shows the location of fire pull-stations and fire extinguishers. Figure 1-2 shows the emergency meeting place outside of Building 241.

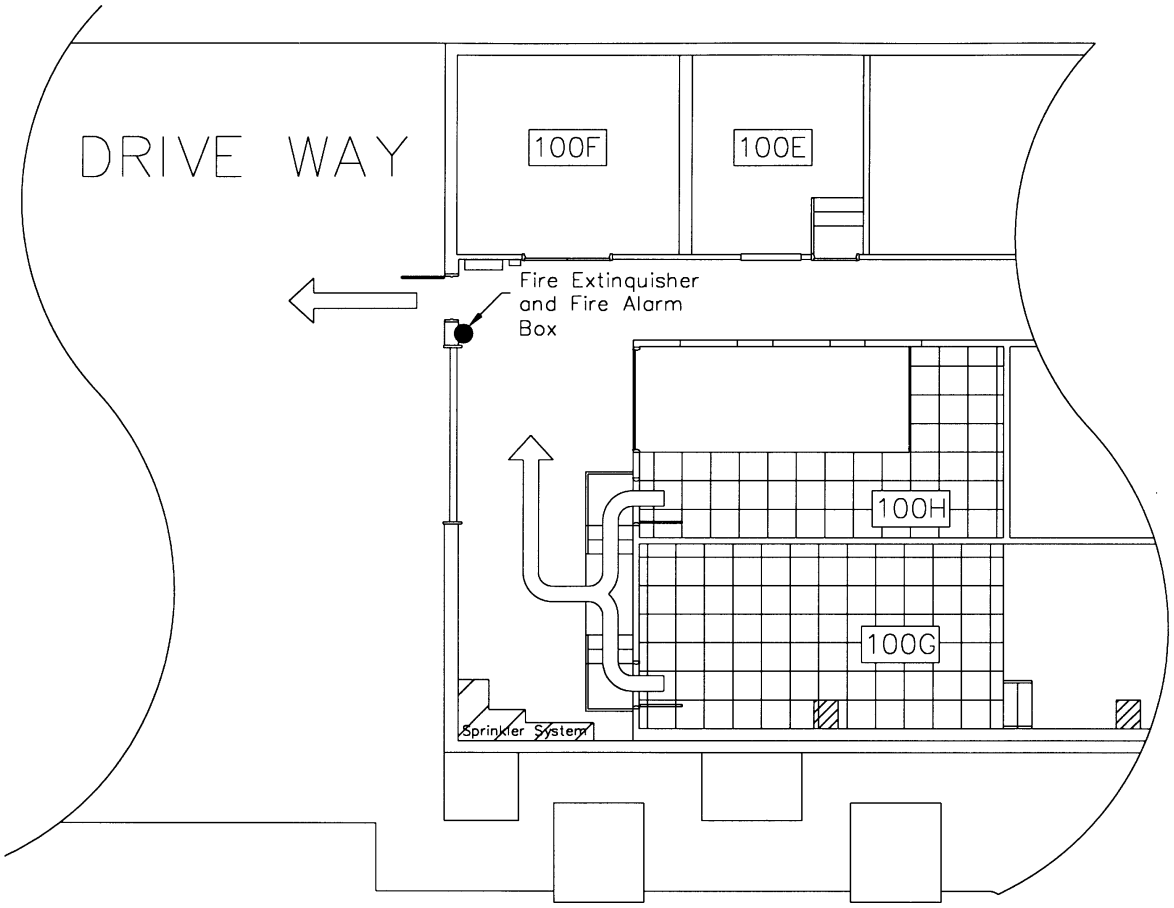

Figure 1-1 241 Facility Clean Room Emergency Exits

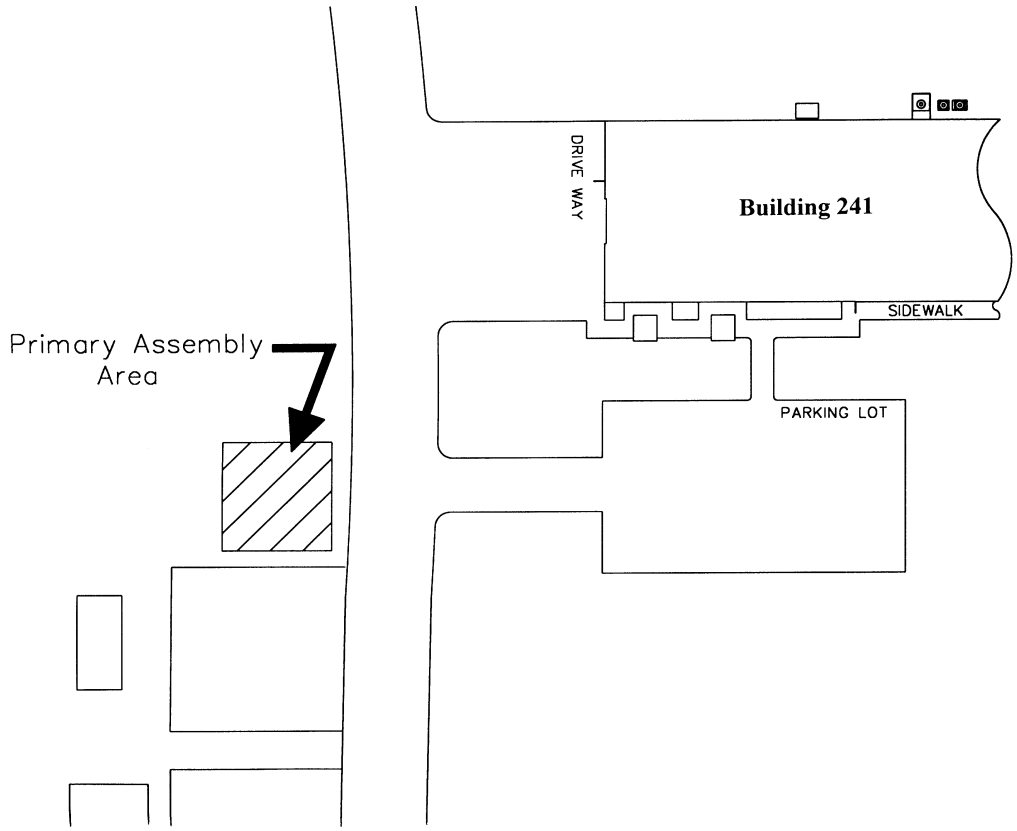

Figure 1-2 241 Facility Emergency Meeting Place

Emergency/Accident Reporting

The Facility Engineer has the primary responsibility of initiating the notification process. General Emergency Instructions:

(1) Sound the alarm and evacuate the area.
(2) If safe, render/de-energize energy systems.
(3) Initiate Flash reporting sequence.
(4) Establish emergency response team to support follow on action.

Figure 1-3 shows the JSC Emergency Number and Reporting Sequence. This number is a coordinated number for the emergency related medical, fire and security groups at JSC.

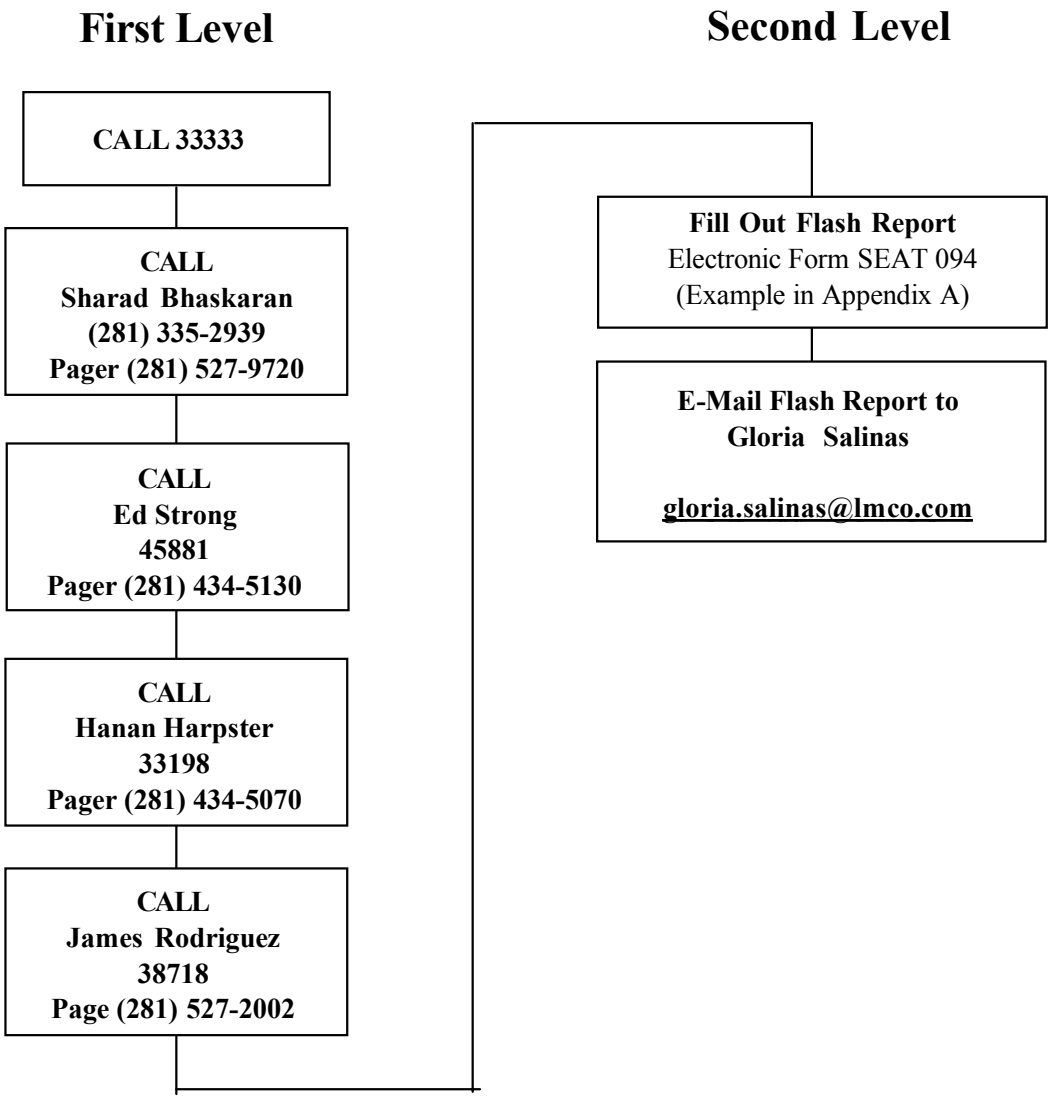

Figure 1-3 JSC Emergency Number and Reporting Sequence

Systems Emergency Procedures

The following procedures are to be carried out by the Test Conductor and Test Personnel in accordance with the condition as defined below:

CONDITION	RESPONSIBILITY	ACTION
Fire/Visible Smoke in Test Area	Test Conductor/Technician	Abort Test

(1) Sound the alarm: Activate alarm at pull box and/or phone in emergency.
(2) Do not move injured personnel unless necessary to prevent further injury.
(3) If safe, attempt to de-energize system, i.e. thermal, electric, etc.
(4) Initiate notification process. This may be conducted away from the situation from a telephone.

CONDITION	RESPONSIBILITY	ACTION
Electrical burn/smoke odor	Test Conductor/Technician	Terminate Test

(1) Shutdown all electrical test equipment systems.
(2) Locate nearest fire extinguisher.
(3) Investigate/Isolate the source of odor.
(4) If required, perform steps associated with a Fire/Smoke situation.

CONDITION	RESPONSIBILITY	ACTION
Loss of Facility Power	Test Conductor/Technician	Hold & Evaluate

(1) Evaluate the situation and impact to test. Investigate the cause and potential frequency of occurrence. Take appropriate steps to restore the failed systems to their nominal/safe operating conditions.

Personnel Emergency/Accident Procedures

CONDITION	RESPONSIBILITY	ACTION
Serious Personal Injury	Test Conductor/Technician	Terminate Test

(1) To prevent further injury, do not move the injured personnel unless necessary.
(2) Render the area safe, then administer first aid as required.
(3) Initiate notification process.
(4) Do not leave injured personnel alone until emergency personnel arrive.

CONDITION	RESPONSIBILITY	ACTION
Minor Personal Injury	Test Conductor/Technician	Hold & Evaluate

(1) Render the area safe, then administer First Aid as required.
(2) Initiate notification process.
(3) Take injured individual to medical treatment facility.

1.3.8 Hazardous Waste Handling

Hazardous material identification, labeling and storage at Building 241 shall be done according to JSC Form 1161, "Disposal Inventory for Miscellaneous Hazardous Wastes." Disposal containers, transportation and disposal will be provided by the designated JSC waste management service. All ITCS waste disposal in Building 241 should be coordinated through the Facility Manager.

2.0 APPLICABLE DOCUMENTATION

The following documents form a part of this Verification Plan to the extent specified. Tasks and activities referenced in pre-test, post-test, and procedural sequences may be performed using the most recent revision of the document stated.

NASA Documents:

Number	Rev.	Title
JHB 5322	C	Contamination Control Requirements Manual
KHB 1700.7	LI	Space Shuttle Payload Group Safety Handbook
LS-71135-3	A	Human Research Facility Integration Flight Prototype Rack Interface Verification Test
NT1-CWI-001	Base-line	Task Performance Sheet (TPS) NT/Occupational Safety and Institutional Assurance Division
NT1-CWI-003	A	Quality Assurance Record Center Discrepancy Reporting and Tracking Systems
SSP57400		Human Research Facility Unique Payload Verification Plan for Rack 1, International Space Program

Boeing Documents:

Number	Rev.	Title
D683-44094-2	A	Human Research Facility Flight Rack Command & Data Handling (C&DH) Acceptance Test Procedure
D683-27519-1	G	User Guide for the Payload Rack Checkout Unit (PRCU)

2.1 APPLICABLE SOFTWARE

N/A

3.0 TESTING PROCESS OVERVIEW

3.1 TESTING OBJECTIVE

The test objectives are as follows:

- Facilitate the successful transfer of the HRF Flight Rack into the PRCU facility.
- Establish the baseline operating procedure for the HRF Flight Rack fluid sampling.

3.2 TEST REQUIREMENTS

The following paragraphs describe the requirements of the specific tests to be conducted and may include references to the specific Verification Requirements Data Sheet (VRDS) to be completed.

3.3 TEST CONDITIONS

3.3.1 Test Conduct Ground Rules

The rules as defined in the following subparagraphs will be followed during all test activities.

3.3.2 Roles And Responsibilities

The Test Conductor is responsible for the overall management and integration of all verification testing at the systems level. The Test Conductor is responsible for the safe, successful control and conduct of all testing. The Test Conductor will assure all test team members are knowledgeable of the subsystems required for the verification test to be performed. The conductor acquires and assigns test resources and is responsible for the adequacy of test documentation. Additional responsibilities are:

- Test schedule coordination
- Test resource management
- Assurance of efficient test conduct
- Data and reports coordination

The Test Engineer is responsible for conducting the specific verification testing, including the coordination of test materials and personnel. The Test Engineer provides the test configuration, test plan and required paperwork/procedures. The Test Engineer is the principal technical

focal point for a given test. The Test Engineer coordinates all test data processing and supports the Test Conductor in the preparation of the post test report.

The Facility Engineer is the member responsible for ensuring that the required instrumentation is calibrated, installed and conditioned to provide the data necessary to meet the test objectives. The Facility Engineer is responsible for the coordination of certified Test Technician/Test Operator support.

The Test Technician/Test Operator is responsible for selection, setup, operation, maintenance and configuration of the test equipment in accordance with the approved test plan and procedure.

3.3.2.1 Test Area Requirements

Special emphasis is to be given to testing flight articles. The following rules will be incorporated into test documentation and compliance is the responsibility of all test team members. Repeated non-compliance may be grounds for denial of access to the test facility.

3.3.2.2 Test Area Cleanliness

Room 100H in Building 241 is certified as a level 100K clean room. Requirements for working in such an environment are detailed in Contamination Control document, JHB 5322C. All test team members with access to room 100H shall be familiar with these requirements and may undergo pre-access training or certification at the discretion of the Facility Engineer. The following rules shall be maintained at all times while in the test facility:

- Smocks, head and beard covers, shall be worn at all times.
- Test Area will be kept clean and orderly at all times.
- All debris created during test preparation, conduct, or tear down will be continuously removed to prevent Foreign Object Damage (FOD) contamination.

3.3.2.3 Test Area Access

Access to all test areas shall be limited during test operations. Only essential personnel shall be admitted. The test area, surrounding test consoles, and test instrumentation shall be controlled to restrain visitors and prevent tampering with the test article or test equipment. Determination of essential personnel will be made by the Test Conductor or Test Engineer, and enforced by the Facility Engineer.

3.3.2.4 Work Area Rules

The following work rules shall be observed for the duration of testing:

- All work stands shall have toe boards sufficient to prevent any item from being accidentally dropped into a test article.
- All work stands shall have the side accessing the test article padded to prevent test article damage in the event the stand comes in contact with the test article.
- Rings and watches must be taped or removed.
- Hard hats must be worn by personnel during forklift operations.
- Forklift operations shall be limited to certified operators only.

3.3.2.5 Temporary Changes

Temporary changes to the Test Article configuration will be accomplished and documented as described in document NT1-CWI-001 TPS NT/Occupational Safety and Institutional Assurance Division.

4.0 TPS AUTHORIZED PERSONNEL

The TPS Authorization is comprised of two (2) types:

- Type A – A Task Performance Sheet that changes the temporary or permanent configuration of the "Flight" (Class I) or Ground Support Equipment (GSE) test hardware. These documents must be reviewed and agreed upon by the customer before obtaining a NASA Signature. Absolutely no work is to be performed without having the proper paperwork in hand with the appropriate signatures.

- Type B – A Task Performance Sheet that does not change the configuration of the hardware which is being tested. These documents do not require a NASA Signature, and are to be coordinated with the customer and submitted for signature.

All documents must have the signature of the Lockheed Martin engineer authority in charge of verification.

If documents require hardware to be pulled out of bond; the appropriate signature authority for the bond room must be included. This list is for reference purposes only, verify before use. The official list is provided in NASA EA5 memo.

LIST OF AUTHORIZED SIGNATURES

Project ID	Project Name	New Project ID	New Project Name	NASA Technical Monitor	Mission Assigned	Other Authorized Signatures
HPMHPMS1	Integration Hardware Definition & Development/Ground Rack Design and Build	HPMS	High Fidelity Mockup/Ground Development Facility/Launch Integration Facility/Payload Rack Checkout Unit	Ed Strong	HRF	Sharad Bhaskaran Robert Henneke Bob Trittipo Tom Wiggins Elton Witt
HPM1	Ground Facilities Development	Deleted – Content moved to HPMS				
HPM3	Water Cooled Rack Development	HPM3	Flight Prototype Rack Integration/Flight Rack Integration	Ed Strong	HRF	Carlos Aquilar Sharad Bhaskaran Todd Leger Kevin Upham
HPCP	HRF Launch Package 1 Hardware Design	Deleted – Content moved to HPM3				
MEIT	Multiple Element Integration Test (MEIT)	Deleted – Content moved to HPM3				

5.0 TEST SET UP

The test setup and tear down will be governed by TPS JSC form 1225.

5.1 PRE-TEST ACTIVITY

N/A

5.2 POST-TEST ACTIVITY

N/A

6.0 TEST PROCEDURE

6.1 RECEIVING OF RACK

6.1.1 Required Equipment

Part Number	Nomenclature	Qty
N/A	Flat Head Screwdriver	1
N/A	Phillips Head Screwdriver	1
N/A	3/4" - 3/8" Deep Drive Well Socket	1
N/A	9/16 - 3/8" Drive Socket	1
N/A	7/16" Open End Wrench	1
N/A	Crescent Wrench (1" spread)	1
McMaster-Carr 85555A41	Torque Wrench (3/8" Drive), 5 to 75 ft-lbs, 0.5 ft-lbs G	1
N/A	3/8" Drive Ratchet	1
N/A	1/2" External Hex Head Wrench	1
N/A	1/2" - 3/8" Drive Socket	1
M25083 (OR Equiv.)	Static Ground Jumper	1
MG2114	MAG 2000 Key Vendor: (Media Recovery, Inc.)	1
N/A	Masking Tape, Roll	1
N/A	Marker, (Sharpie)	1
N/A	6' Step Ladder (or equiv.)	1
TBD	OHM Meter	1
N/A	Tape Measure	1
N/A	Level	1
Model 155F	Heartwatch, Media Recovery, Inc.	1
N/A	6,000 lbs (minimum) Forklift (72" forks)	1

6.1.2 Forklift Operations

6.1.2.1 Unload RSC From Truck

1. Direct low boy semi-truck carrying the RSC to the front of Building 241.

2. Remove all tie downs and tarp(s) from the RSC.

3. Gather special tools listed in Section 6.1.1 of this document. Verify all applicable equipment is within current certification, and record calibration information on the TPS.

4. Establish a control area around the RSC loading area.

5. Provide a working space for the forklift to remove the RSC from the low boy truck.

6. Direct the forklift to the RSC. Refer to Figure B-1, Appendix B in this document.

7. Direct the forklift with the 72” forks to the RSC. Refer to Figure B-2, Appendix B in this document.

8. Once the forklift and spotters are in position, direct the fork lift operator to insert the forks into the two slot openings at the bottom of the RSC.

9. Once an inspection of the forks has been correctly inserted, lift and remove the RSC from the low boy semi-truck.

10. Lower the RSC till the bottom skids are four (4) to six (6) inches from the ground.

11. Move the RSC just outside of the roll up door and carefully set it down for receiving inspection. Refer to Figure B-3, Move 1, Appendix B in this document.

12. Perform a receiving inspection of the RSC exterior. Document any discrepancy.

T: _____ QA: _____

6.1.2.2 Transfer RSC To Storage

1. Once the receiving and inspection has been completed; direct the forklift operator to move the RSC into Building 241. Refer to Figure B-4, Move 2, Appendix B in this document.

2. Dismiss the forklift operator.

NOTE: If storing empty RSC the following step will not be performed.

3. Ground the RSC to the facility ground by performing the following steps:

- Remove the bolt, nut, and washer(s) from the RSC-to-Facility Ground point located on the left side of the RSC.
- Mount the facility ground wire to the RSC grounding point located on the RSC-to-Facility Ground point. Refer to Figure B-5, Appendix B.

N/A: _____ T: _____ QA: _____

6.1.2.3 Position RSC For RHA Removal

1. Remove the facility ground cable from the RSC-to Facility Grounding point. Refer to Figure B-5, Appendix B.

2. Move the RSC from the inside of Building 241 to the unpacking position. Refer to Figure B-19, Move 1, Appendix B in this document.

6.1.3 RSC Operations

6.1.3.1 Attachment of Ground

Ground the RSC to the facility ground by performing the following procedures:

- Remove the bolt, nut, and washer(s) from the RSC-to-Facility Ground point located on the right-hand side of the RSC. Refer to Figure B-5, Appendix B.
- Mount the facility ground wire to the RSC grounding point located on the RSC-to-Facility Ground point.

T: _____ QA: _____

6.1.3.2 Inspection of Humidity Indicator

Visually inspect the humidity indicator for color. The location of the humidity indicator is stenciled on the face of the RSC door. See Figure B-7, Appendix B. Normal operational level is indicated by a white color. A humidity violation is indicated by an orange color.

T: _____ QA: _____

6.1.3.3 Reduction of Internal Pressure

1. Open one of the two spring loaded hinged breather valve covers by adjusting or rotating the two quarter-turn fasteners using a standard flathead screwdriver. Refer to Figure B-8, Appendix B.

2. Gently depress the exposed breather valve until pressure is equalized (approximately three (3) to five (5) seconds).

3. Close the breather valve cover by fastening the two (2) quarter-turn fasteners using a flathead screwdriver.

T: _____ QA: _____

6.1.3.4 Unsealing of Door

1. Unlatch the thirteen (13) latches around the door. (Three (3) latches are located on the top of the container, three (3) on each of the left and right-hand sides, and four (4) on the bottom side).

WARNING: The latch on the lower-right bottom side must be placed in the stowed position in order to prevent damage to the RSC.

2. Open lockable clasp and verify it is clear of door operation.

   NOTE: The following step requires two (2) people. One person shall be placed at each of the handles located left and right of center on the RSC door. The handles MUST be pulled simultaneously in order to effectively break the seal on the container.

3. Pull on the door handles until a minimum gap of approximately 0.50 inches appears on the right-hand side; unsealing the edges of the door and the container. (If binding occurs while attempting to open the door, close the door and repeat step until door swings open easily).

4. Open the door so that it is perpendicular to the right side of the RSC (180 degrees from the closed position).

T: _____ QA: _____

6.1.3.5 Inspection of Temperature Indicator Receiving

Visually inspect the temperature indicator. The temperature indicator is on the inside surface of the door to the left of the humidity indicator window. Refer to Figure B-9, Appendix B. A white or light pink color indicates normal operating conditions. A red or hot pink color indicates a temperature violation has occurred. If a violation occurs, proceed with the following:

- Record that a temperature indicator violation has occurred.
- Remove the indicator.
- Install a new indicator on the surface of the RSC door.

T: _____ QA: _____

6.1.3.6 Inspection of Accelerator Indicator

1. Visually inspect all three (3) acceleration limit indicators, refer to Figure B-10, Appendix B. If the Rack Handling Adapter (RHA) has been subjected to a shock load greater than 3.5 G's, a violation has occurred. When a shock violation has occurred, a visible red magnet will be out and away from the center of the indicator. If no shock violation has occurred, the red magnet will be in the center of the indicator.

   T: _____ QA: _____

2. If no shock violation has occurred, proceed to Section 6.1.3.7.

3. If a shock violation has occurred, proceed with the following steps:

   - Place the MAG 2000 key (P/N MG2114) over the clear plastic cover and into the cover notches.
   - Gently press on the MAG 2000 key and carefully turn the cover counter-clockwise (approximately three (3) degrees) until the key no longer turns.

   CAUTION: Excessive force in removing the indicator cover may damage the cover notches.

   - Remove the MAG 2000 key and turn the cover counter-clockwise until the taps of the cover align with indicator base notches.
   - Remove the clear plastic cover and retain for reinstallation.
   - Move the red magnet to the center position of the indicator.
   - Install the plastic cover by aligning the notches and carefully turning clockwise until cover clicks into the closed position.

   T: _____ QA: _____

6.1.3.7 Disconnection of RHA Ground

1. Disconnect the RSC from the RSC ground cable found on the lower left-hand side gusset of the RHA by removing the bolt, nut, washers. Retain the mounting hardware for reinstallation. Refer to Figure B-5, Appendix B.

2. Install the mounting hardware onto the RSC ground cable terminal.

3. Secure the ground cable to the side of the RSC using tie wrap or tape to ensure that the ground cable will not interfere with the RHA removal.

T: _____ QA: _____

6.1.3.8 Removal of RHA

1. Mark each of the fork tines at 49-inches and 51-inches from the leading edge of the tines. Refer to Figure B-11, Appendix B.

2. Direct the forklift operator to align the forklift with the RSC approximately 24 inches from the RSC door opening.

3. Position one person on each side of the RSC door opening to direct the movement of the forklift.

4. Direct the forklift operator to position the leading edge of the forklift tines to the opening of the RHA forklift tubes located at the top of the RHA. Verify that the fork tines are in position to enter the RHA tubes unhindered.

5. Direct the forklift operator to slowly insert the forklift tines into the RHA tubes to a point between the 49-inch and the 51-inch marks on the tines. Ensure that the forklift tines do <u>not</u> insert into the RHA tubes beyond the 51-inch mark. Refer to Figure B-11, Appendix B.

6. Use the following procedure to open the trunnion retention latch assembly caps:

   - Loosen the eight (8) T-bolts adequately to rotate the T-bolts off from the trunnion retention latch assembly cap. Do not remove the nut from the T-bolt, refer to Figure B-12, Appendix B.
   - Open the trunnion retention latch assembly cap by rotating it off of the trunnion. Refer to Figure B-13, Appendix B.
   - Direct the forklift operator to slowly raise the RHA until the trunnions are clear of their respective retention latch assemblies (approximately three (3) inches).
   - Direct the forklift operator to slowly remove the RHA from the RSC.

7. Remove the two (2) lower trunnions from the retention latch per the following five (5) steps:
   - To prevent the trunnion from falling, loosen the nut on the trunnion retention latch assembly T-bolt using a ¾ inch well socket.

- Sufficiently loosen the nut and rotate the T-bolt away from the latch assembly cap.
- Rotate the latch assembly cap to the open position.

WARNING: Care must be taken to prevent damage and degradation to the surface of the trunnion and the latch assembly.

- Remove the trunnion from the latch assembly.
- Repeat the previous four (4) steps for the second trunnion.

T: _____ QA: _____

6.1.3.9 Door Closure For Empty Storage

1. Push the door closed until the door seal engages using the left handle. A gap will be seen around the door.

2. Push the door towards the closed position until all of the door latches are able to capture.

3. Latch the thirteen (13) door latches using a standard 1" box wrench in the following sequence:

   - Center latch, left side.
   - Center latch, right side.
   - The remaining door latches.

T: _____ QA: _____

6.1.4 RHA Operations

6.1.4.1 Assembly To The Marshall Space Flight Center (MSFC) Base

1. Remove the four (4) hex bolts from the four (4) nut plates on the RHA base and retain for installation. Store the hex bolts in bags and affix them to the RHA base. These trunnions can be stored in the RSC or Building 241 Controlled Storage.

2. Remove the two (2) lower trunnions on the RHA.

3. Retain the two (2) trunnions for reinstallation onto the RHA.

4. Align the RHA above the MSFC Base Assembly (P/N: 220G7470-001). The front of the RHA must be facing the swivel casters of the MSFC base assembly for proper installation.

5. Align the two (2) RHA pins with the corresponding holes in the bottom of the RHA lower structure. See Figure B-14, Appendix B.

6. Lower the RHA onto the MSFC base assembly.

WARNING: Do not remove the forklift from the RHA, the forklift must continue to support the weight of the Rack and the RHA.

7. Check the acceleration limit indicators as per Step 6.1.3.6 of this document.

T: _____ QA: _____

8. Attach the RHA to base as follows:

- Degrease the four (4) hex bolts.
- Apply a small amount of Apiezon-L grease or equivalent, to each of the four (4) hex bolt threads.
- Install the two (2) rear bolts through the 4' X 4' tubes located at the bottom of the RHA into the nut plates on the RHA base.
- Tighten the rear bolts snuggly using a 3/8" drive ratchet with a 3/4" standard socket.
- Install the two (2) front hex bolts, and tighten snuggly.
- Torque the four bolts using a 12" long torque wrench (3/8" Drive) with a 3/4" standard socket to 587- 690 in/lbs. above running torque.

T: _____ QA: _____

9. Move the forklift away from the RHA.

10. Move the RHA/MSFC Base assembly away from the pathway of the empty RSC and the building roll-up door.

T: _____ QA: _____

6.1.4.2 Assembly To The Kennedy Space Center (KSC) Base

1. Remove the four (4) hex bolts from the four (4) nut plates on the RHA base and retain for installation. Store the hex bolts in bags and affix them to the RHA base. These trunnions can be stored in the RSC or Building 241 Controlled Storage.

2. Remove the two (2) lower trunnions on the RHA.

3. Retain the two (2) trunnions for reinstallation onto the RHA.

4. Move the RHA to reside over and above the KSC Base Assembly (P/N: 220G7475-001). The front of the RHA must be facing the swivel casters of the KSC base assembly for proper installation.

5. Lower the RHA aligning the two pins with the corresponding holes in the bottom of the RHA lower structure. See Figure B-15, Appendix B.

6. Lower the RHA onto the KSC base assembly.

WARNING: Do not remove the forklift from the RHA, the forklift must continue to support the weight of the Rack and RHA.

7. Check the acceleration limit indicators as per Step 6.1.3.6.

8. Attach the RHA to base as follows:

   - Degrease the four (4) hex bolts.
   - Apply a small amount of Apiezon-L grease or equivalent, to each of the four (4) hex bolt threads.
   - Install the two (2) rear bolts through the 4' X 4' tubes located at the bottom of the RHA into the nut plates on the RHA base.
   - Tighten the rear bolts snuggly using a 3/8" drive ratchet with a 3/4" standard socket.
   - Install the two (2) front hex bolts, and tighten snuggly.
   - Torque the four bolts using a 12" long torque wrench (3/8" Drive) with a 3/4" standard socket to 587- 690 in/lbs. above running torque.

T: _____ QA: _____

9. Move the forklift away from the RHA.

10. Move the RHA/KSC Base assembly out of the way from the pathway of the empty RSC and the building roll-up door.

T: _____ QA: _____

6.1.4.3 Placement in Clean Room

1. Move RHA/Base assembly to the front double doors of the clean room. See Figure B-3 Move 2, Appendix B in this document.

WARNING: The RHA must not exceed 2.5 MPH.

2. Remove the stoppers from the rear casters. Lock the rear casters in an outward position (90º from the original position).

T: _____ QA: _____

3. Clean all three (3) assemblies of the RHA/Base assembly, (rack, rack base, and rack-handling adapter) to Level GC found in document SN-C-0005.

4. Clean the floor to a visible clean status around the double doors of the clean room, and around the RHA/Base out to approximately ten (10) feet.

5. Wait for the building's internal temperature and humidity to stabilize. Open the clean room double doors and move the RHA/MSFC Assembly into the clean room to the position shown in Figure B-3, Move 3, Appendix B in this document.

6. Once the RHA/Base assembly has been moved into position, all non-essential personnel without clean room clothing should leave and close the double doors to the clean room.

7. Unlock the rear casters and align the wheels in the original positions, and lock in place. Reinstall the stoppers.

T: _____ QA: _____

6.1.4.4 Attachment of Grounding

Ground the RHA/MSFC assembly by connecting the clean room facility ground wire to the RHA frame as shown in Figure B-16, Appendix B.

T: _____ QA: _____

6.2 WATER SAMPLING

6.2.1 Required Equipment

Space Station Water is considered a hazardous material when handling Space Station Water the following protective equipment must be worn:

Part Number	Nomenclature	Qty
	Clear Plastic Facemask	1
	Waterproof plastic gloves	1

6.2.2 Rack Receiving/Shipping Water Sample

> CAUTION: Space Station Water is considered a hazardous material protective equipment is necessary to perform this section.

1. Connect the rack thermal supply hose to the PRCU International Standard Payload Rack (ISPR) Moderate Temperature Control Loop (MTCL) Supply.

2. Connect the water sampling hose (SEG38116092-301) to the PRCU thermal return hose. Verify the water sampling hose valve is closed.

   T: _____ QA: _____

3. Connect the rack thermal return hose to the PRCU thermal return connector saver.

4. Activate PRCU and rack per LS-71139-2 Section 6.0.

   T: _____ QA: _____

5. Activate the Expedite the Processing of Experiments to Space Station (EXPRESS) Laptop per LS-71139-5 Section 6.0.

   T: _____ QA: _____

6. Using the PRCU, command the rack internal thermal valves to full open.

   NOTE: Thermal valves on the GSE Transfer Hoses must be opened manually. First open supply valve followed by the return valve.

   T: _____ QA: _____

7. Open the valve on the water sampling hose and drain off approximately one quarter (1/4) liter(s) of water to flush out the return and water sampling hose lines.

8. Collect the water sample. Close the valve on the water sample hose when the water sample has been collected.

   T: _____ QA: _____

9. Open the valve on the water sampling hose and purge approximately five (5) gallons of water.

10. Close the valve of the water sampling hose.

T: _____ QA: _____

11. If using GSE Transfer Hoses manually, close the valves.

N/A: _____T: _____ QA: _____

12. Deactivate the EXPRESS Laptop per LS-71139-5 Section 6.0.

T: _____ QA: _____

13. Deactivate the PRCU and payload rack per LS-71139-2 Section 6.0.

T: _____ QA: _____

14. Disconnect the water sampling hose (SED38116092-301) from the PRCU thermal return hose.

T: _____ QA: _____

15. Disconnect the rack thermal supply hose from the PRCU ISPR MTCL supply.

N/A: _____T: _____ QA: _____

16. Return the water sampling hose (SED38116092-301) to Building 241 controlled storage.

T: _____ QA: _____

6.3 SHIPMENT OF RACK

6.3.1 Required Equipment

Part Number	Nomenclature	Qty
N/A	Flat Head Screwdriver	1
N/A	Phillips Head Screwdriver	1
N/A	3/4" - 3/8" Deep Drive Well Socket	1
N/A	9/16 - 3/8" Drive Socket	1
N/A	7/16" Open End Wrench	1
N/A	Crescent Wrench (1" spread)	1
McMaster-Carr 85555A41	Torque Wrench (3/8" Drive), 5 to 75 ft-lbs, 0.5 ft-lbs G	1
N/A	3/8" Drive Ratchet	1
N/A	1/2" External Hex Head Wrench	1
N/A	1/2" - 3/8" Drive Socket	1
M25083 (OR Equiv.)	Static Ground Jumper	1
MG2114	MAG 2000 Key Vendor: (Media Recovery, Inc.)	1
N/A	Masking Tape, Roll	1
N/A	Marker, (Sharpie)	1
N/A	6' Step Ladder (or equiv.)	1
TBD	OHM Meter	1
N/A	Tape Measure	1
N/A	Level	1
Model 155F	Heartwatch, Media Recovery, Inc.	1
MAG2000	3.5, HH, A, Shock Limit Indicator	2
MAG2000	3.5, VV, A, Shock Limit Indicator	2
MIL-D-3464, Type 2	Desiccants	30
TA378-HC-MHI	Humidity Indicators, ACM	1
N/A	6,000 lbs (minimum) Forklift (72" forks)	1

6.3.2 RHA Operations

6.3.2.1 Disconnect of Ground

Ground the RSC by performing the following procedures. Refer to the RSC-To-Facility Ground Connector Panel in Figure B-5, Appendix B.

- Remove the bolt, nut, and washers from the RHA ground attach point and retain for reinstallation.
- Place the free end of the RSC-to-RHA grounding strap in position over the mounting hole of the RHA Ground Attach Point.
- Attach the ground strap to the RHA by installing the bolt, nut, and washers, and snuggly tighten.
- Perform a continuity check. Resistance should be less than 1.0 Unit of Electrical Resistance (Ohm).

T: _____ QA: _____

6.3.2.2 Transfer From Clean Room

1. Detach facility ground wire from the RHA. Refer to Figure B-16, Appendix B.

1. Remove the stoppers from the rear casters. Turn the casters outward 90º, and lock in place.

T: _____ QA: _____

3. Open the double doors to the clean room.

4. Move the RHA/Base assembly out of the clean room to the shipping receiving area as shown in Figure B-6, Move 1, Appendix B in this document.

WARNING: The RHA must not exceed 2.5 MPH.

5. Unlock the rear casters and return to the original position. Reattach the stoppers.

T: _____ QA: _____

6.3.2.3 Disassembly From The Base

1. Mark each of the fork tines at 49-inches and 51-inches from the leading edge of the tines. Refer to Figure B-11, Appendix B.

2. Direct fork lift operator to the back of the RHA/Base as shown in Figure B-11, Appendix B and insert the forklift tines into the RHA tubes to a point between 49-inches and the 51-inches mark on the fork lift tines.

3. Direct the forklift operator to slowly raise the forklift tines to just touch the top of the RHA tube. Refer to Figure B-11, Appendix B.

4. Unbolt the RHA base while continuing to support the RHA with the forklift.

WARNING: Do not remove the forklift.

5. Per the task leader's instruction, direct the forklift to raise the RHA off of the base.

6. Move the base from underneath the RHA to an alternate area from the rack loading area.

7. Remove the four (4) nuts from each of the eight (8) trunnions using a 7/16-inch wrench and a 9/16-inch socket and retain for re-installation.

8. Install trunnion by inserting the four mounting bolts of the trunnion into the mounting holes of the RHA mounting pad. Install the four nuts finger tight.

9. Apply tape, if required to protect trunnions during torque operations.

10. Torque the four trunnions bolts to 240-285 in-lbs above running torque.

11. Repeat the steps 8-10 for each of the eight trunnions to be installed onto the RHA upper structure.

T: _____ QA: _____

6.3.2.4 Preparation For Insertion of the RHA Into The RSC

1. Reduce the internal pressure in the RSC by performing Section 6.3.3.1 RSC Internal Pressure Reduction.

2. Perform Section 6.3.3.2 RSC Door Opening to unseal container.

3. Move the RHA to the front of the RSC as shown in Figure B-6, Move 2, Appendix B in this document.

4. Direct the forklift operator to lower the RHA to the position shown in Figure B-18 and Figure B-13, Appendix B to align and insert into the RSC.

T: _____ QA: _____

6.3.3 RSC Operations

6.3.3.1 Reduction of Internal Pressure

See Section 6.1.3.3 Reduction of Internal Pressure.

6.3.3.2 Unsealing of Door

See Section 6.1.3.4 Unsealing of Door.

6.3.3.3 Inspection of Accelerator Indicator

Check the accelerometers for limit tripping. If limit tripping has occurred, refer to Section 6.1.3.6 RSC Accelerator Indicator Inspection, for a procedure on resetting the accelerometers.

T: _____ QA: _____

6.3.3.4 Insertion of RHA

1. Slowly insert the RHA into the RSC as shown in Figure B-18, Appendix B.

2. Once the RHA has been lowered into position on the trunnion latches (Figure B-18, Appendix B), direct the forklift operator to back away from the RSC and out of the area.

3. Inspect the RHA in the RSC for possible damage and mis-alignments.

4. Close the trunnion latches as shown in Figure B-13, Appendix B.

T: _____ QA: _____

5. Tighten all eight T-Bolt nuts and torque to 75-80 in-lbs.

6. Inspect all latches to ensure they are properly closed.

T: _____ QA: _____

6.3.3.5 Attachment of Internal Ground

1. Connect the RSC internal grounding cable to the RHA lower left-hand side gusset.

T: _____ QA: _____

2. Perform continuity check, resistance should be less than 1.0 Ohm.

T: _____ QA: _____

6.3.3.6 Attachment of External Ground

Connect the RSC ground by performing the following procedures:

- Remove the bolt, nut and washers from the RHA ground attach point and retain for installation.
- Place the free end of the facility ground strap in position over the mounting stud of the RHA ground attach point. Refer to Figure B-5, Appendix B.
- Attach the facility ground strap to RHA by installing the bolt, nut and washers, and tighten.
- Perform a continuity check, resistance should be less than 1.0 Ohm.

T: _____ QA: _____

6.3.3.7 Installation of Humidity Indicator

Remove and replace existing humidity indicator with the new humidity indicator as shown in Figure B-9, Appendix B.

T: _____ QA: _____

6.3.3.8 Installation of Desiccant

Remove and replace all of the existing desiccants with the new desiccants in the desiccant box as shown in Figure B-9, Appendix B.

T: _____ QA: _____

6.3.3.9 Installation of Temperature Indicator

Remove and replace the old temperature indicator with a new temperature indicator as shown in Figure B-9, Appendix B.

T: _____ QA: _____

6.3.3.10 Door Closure for Shipment

1. Push the RSC door closed using the left handle until the door seal engages. A gap will be seen around the edges of the door.

   NOTE: The following step requires two (2) people. A person shall be placed at each of the handles located left and right of center on the door of the RSC. The handles MUST be pushed simultaneously in order to properly seal the container.

2. Seal the door sufficiently for the door latches to capture.

   NOTE: The following step requires two (2) people. The center latches on the left and right side of the door MUST be secured concurrently before tightening the remaining latches.

3. Latch the thirteen (13) latches using a standard 1" box wrench in the following sequence:

   - Center latch, left side.
   - Center latch, right side.
   - Latch the remaining door latches.

4. Apply the QA provided security seal to the RSC door near the door clasp.

T: _____ QA: _____

6.3.4 Forklift Operations

6.3.4.1 Transfer From Storage

Using a forklift, move the RSC from Building 241 to the outside position. Refer to Figure B-17, Move 1, Appendix B in this document.

T: _____ QA: _____

6.3.4.2 Position RSC for RHA Insertion

See Section 6.1.2.3 Position for RHA Removal.

6.3.4.3 Loading RSC on Truck

1. RSC Ground Disconnecting

   Remove the facility ground strap by performing the following procedures.

   - Remove the bolt, nut and washers from the RHA ground attach point and retain for installation.
   - Remove the free end of the facility ground strap in the position over the mounting stud of the RHA ground attach point. Refer to Figure B-11, Appendix B.
   - Reattach and tighten the bolt, nut and washers snuggly.

T: _____ QA: _____

2. Direct the semi-truck to the front of Building 241.

3. Provide a working space for the forklift to move the RSC to the semi-truck. Refer to Figure B-19, Move 1 or Move 2, Appendix B in this document.

4. Direct the forklift operator with the 72” tine forklift to the front of the RSC.

5. Position two (2) spotters on each side of the forklift at a safe distance from the RSC in case of tipping during unloading.

6. The task leader directs the fork lift operator to insert the forks into the two slot openings at the bottom of the RSC when the forklift and spotters are in position.

7. Raise up the RSC to an approximate height of four (4) to six (6) inches and move the RSC to the center of the flatbed trailer of the semi truck.

8. Direct the forklift operator to raise the RSC onto the flat bed trailer. Ensure that the RSC is positioned in the center of the trailer both length and width wise for center loading.

9. Dismiss the forklift driver.

10. Using tie downs, secure the RSC to the flat bed.

11. Fully cover and secure the entire RSC with tarps.

12. Dismiss the semi truck.

T: _____ QA: _____

APPENDIX A

JSC Forms
These forms are for reference only.

1. PROJECT CODE	2. JPIC CODE	**TASK PERFORMANCE SHEET** NASA - LYNDON B. JOHNSON SPACE CENTER				
3. TYPE A	CONFIGURATION CHANGE		4. TPS NO.		5. PAGE	OF
PERMANENT	TEMPORARY		6. MOD SHEET(S) NUMBER(S)	7. ORG.	8. SYSTEM	9. NEED DATE
B	NONCONFIGURATION CHANGE					
10. PART NAME		11. PART NO./DRAWING NO.		12. SERIAL/LOT	13. TIME/CYCLE/SHELF LIFE ☐ YES ☐ NO	
14. APPLICABLE DOCUMENTS		15. CONTRACT NO./JOB NO.		16. HAZ. TASK ☐ YES ☐ NO	17. ENG. EVAL. ☐ YES ☐ NO	
18. SHORT TITLE OF TPS					19. ADP UPDATE ☐ YES ☐ NO	

20. OPER SEQ. NO.	21. OPERATIONS *(Print, Type, or Write Legibly)*	VERIFICATION 22. TECH.	23. QA/DV

24. ORIGINATOR	DATE	25. FINAL ACCEPTANCE STAMP AND DATE

APPROVALS *(Printed or Typed and Signed)*

26. PROJECT ENGINEER	DATE	27. QUALITY ENGINEER	DATE
28.		29.	
30.		31.	

JSC Form 1225 (Rev February 7, 2000) (MS Word August 1996)

Figure A-1 Task Performance Sheet

		5. Page	of
TASK PERFORMANCE SHEET CONTINUATION PAGE NASA - LYNDON B. JOHNSON SPACE CENTER		4. TPS NO.	
		6. MOD NO.	

20. OPER SEQ. NO.	21. OPERATIONS *(Print, Type, or Write Legibly)*	VERIFICATION 22. TECH.	23. QA/DV

JSC Form 1225A (Rev February 7, 2000) (MS Word August 1996)

Figure A-2 Task Performance Continuation Sheet

1. JPIC

Discrepancy Report/Material Review Record
NASA - Lyndon B. Johnson Space Center

2. Page 1 of ____

3. Ref. Doc # | 4. IDR # | 5. DR #

6. Name of Top Assy. | 7. Drawing or P/N | 8. S/N or Lot # | 9. Qty.

10. Name of Sub Assy | 11. Drawing or P/N | 12. S/N or Lot # | 13. Qty.

14. Name of Component | 15. Drawing or P/N | 16. S/N or Lot # | 17. Qty.

18. Description of nonconformance

19. Initiator's name (print and sign) | 20. Title/Stamp No. | 21. Org. | 22. Location | 23. Date

24. Responsible Engineer/Mail Code | 25. CHRP Code | 26. CAGE Code | 27. Time/cycles used

xx. Category
☐ Critical
☐ Major
☐ Minor

29. PRACA Reportable ☐ Yes ☐ No

30. Configuration Change? ☐ Yes ☐ No

31. Waiver? ☐ Yes ☐ No

32. Corrective Action ☐ Yes ☐ No

FIAR # _____ DCN # _____ Waiver # _____ CAS # _____

33. Final Disposition
☐ Rework ☐ Repair ☐ Change Classification ☐ Scrap
☐ Use-as-is ☐ Return to vendor/supplier ☐ Written in error

34. MRB Req'd?
☐ Yes
☐ No

35. Final Acceptance Stamp and

Material Review Board
(approvals must be typed or printed and signed)

36. Stress Engineer | Date | 37. Materials Engineer | Date

38. Project Engineer | Date | 39. Quality Engineer | Date

40. Other (print or type title) | Date | 41. QA Rep. (NASA) | Date

T1 Resp. Org. | T2 HW Type | T3 Prev. Cond. | T4 Fail. Mode | T5 Defect | T6 Remedial Act. | T7 Cause | T8 Recur. Ctrl. | T9 Perf. Org. | T10 Proc. Flow

JSC Form 2176 (Rev August 10, 1999) (MS Word Sep 97)

Figure A-3 Discrepancy Report/Material Review Record

1. IDR #	**Discrepancy Report/Material Review Record**	3. Page ____ of ____
2. DR #	NASA - Lyndon B. Johnson Space Center	

Continuation Sheet

4. Insp. Pts.	5. Seq. No.	6. Instructions *(Print, type, or write legibly)*	7. Verification Stamps Tech.	Qual.

8. Final Acceptance Stamp and Date

JSC Form 2176A (Sep 97) (MS Word Sep 97)

Figure A-4 Discrepancy Report/Material Review Record Continuation Sheet

1. DR #

Discrepancy Report/Material Review Record

NASA - Lyndon B. Johnson Space Center

2. Page ____ of ____

Summary Sheet

3. Configuration Change? ☐ No ☐ Yes DCN #

4. CCBD #

5. PRACA #

6. Remedial Action

7. Root Cause

8. Corrective Action (Recurrence Control)

MRB APPROVAL

9. Stress Engineer (Print and sign)	Date	10. Materials Engineer (Print and sign)	Date
11. Project Engineer (Print and sign)	Date	12. Quality Engineer (Print and sign)	Date
13. Other (Print and sign)	Date	14. QA Rep. (NASA) (Print and sign)	Date

JSC Form 2176B (Oct 97) (MS Word Sep 97)

Figure A-5 Discrepancy Report/Material Review Record Summary Sheet

1. DR #

2. Page ____ of ____

Discrepancy Report/Material Review Record

NASA - Lyndon B. Johnson Space Center

Multiple Disposition Coding Sheet

	T1 Resp. Org.	T2 HW Type	T3 Prev. Cond.	T4 Fail. Mode	T5 Defect	T6 Remedial Act.	T7 Cause	T8 Recuf. Ctrl.	T9 Perf. Org.	T10 Proc. Flow
A.										
B.										
C.										
D.										
E.										
F.										

3. Quality Engineer (Print and Sign) Date

JSC Form 2176C (Oct 97) (MS Word Oct 97)

Figure A-6 Discrepancy Report/Material Review Record Multiple Disposition Coding Sheet

LOCKHEED MARTIN

FLASH REPORT

For Safety and Product Assurance use only

NASA mishap no.	
OSHA file no.	

GENERAL INFORMATION	
1. Date (MM/DD/YY)	2. Time ☐ a.m. or ☐ p.m.
3. Building number/location	4. Specific area

5. Category of incident (check appropriate box)

☐ Injury/accident ☐ Fire

☐ Auto accident ☐ Explosion

☐ Chemical spill ☐ Other

6. Description of incident (explain what happened, including cause or description of failure)

7. SEAT involvement (name of organization)

PERSONNEL INVOLVED	
8. Name (last, first, middle initial)	9. Telephone
CONTACT PERSON	
10. Name (last, first, middle initial)	11. Telephone

FORM SEAT 094 (09/23/97)

Figure A-7 Flash Report

DISPOSAL INVENTORY
FOR MISCELLANEOUS HAZARDOUS WASTES

GENERAL NOTES:

1. Waste sources must be identified.
2. Exceptions:
   See JSCI 8837 (current issue) for disposal methods for batteries, ether, explosives, empty drums, paint and chemical containers, radioactive and biological wastes, and precious metals.
3. Containers must be waterproof.
4. Containers must be labeled; all unlabeled containers will be returned to generators for proper identification.
5. For pickup, call x32038

TO BE COMPLETED BY WASTE GENERATOR.

DATE
BUILDING NO.
ROOM NO.
NAME
PHONE EXTENSION
MAIL CODE
CARTON NO. _____ OF _____
Provide the following information at time of pickup: **PICK-UP TICKET NO.:**

INVENTORY

(Use a separate form for each carton of waste.
A copy of Inventory must be in or on each carton.)

IDENTIFICATION AND SOURCE OF WASTE	AMOUNT	IDENTIFICATION AND SOURCE OF WASTE	AMOUNT

JSC Form 1161 (Rev Aug 97) (MS Word Aug 97) COPY 1 - SHIPPING COPY 2 COPY 3 - ORIGINATOR

Figure A-8 Disposal Inventory for Miscellaneous Hazardous Wastes

Repetitive Operations Log						
Document Number : LS 71139-1 Rev ___						Page ____ of ____
Section Number	Step Number(s)	Test Conductor	Date	Tech	QA	Reason/Remarks

Figure A-9 Repetitive Operations Log

Deviation					Page ___ of ___
TPS Number:			Document Number:	Project Manager:	Test Engineer:
Dev No	Section	Step	Type (P/T)	Change	Reason
Originator:			Phone:	Date:	Quality Engineer:

Figure A-10 Deviation Sheet

Deviation Continuation Page				TPS Number:	Document Number:	Page ___ of ___
Dev No	Section	Step	Type (P/T)	Change	Reason	

Figure A-11 Deviation Continuation Sheet

APPENDIX B

Illustrations

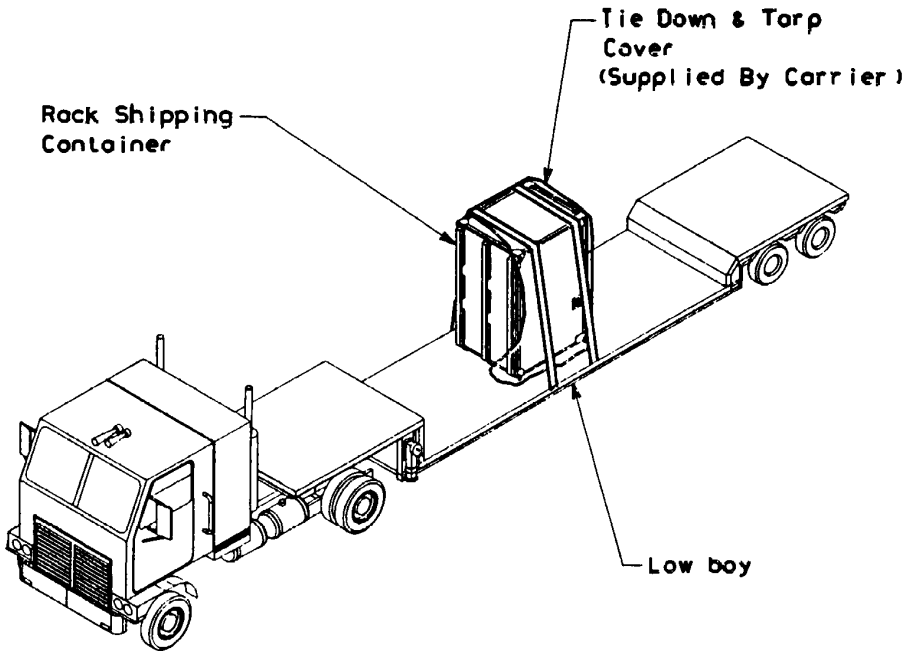

Figure B-1 Vertical/Overland Transportation Configuration

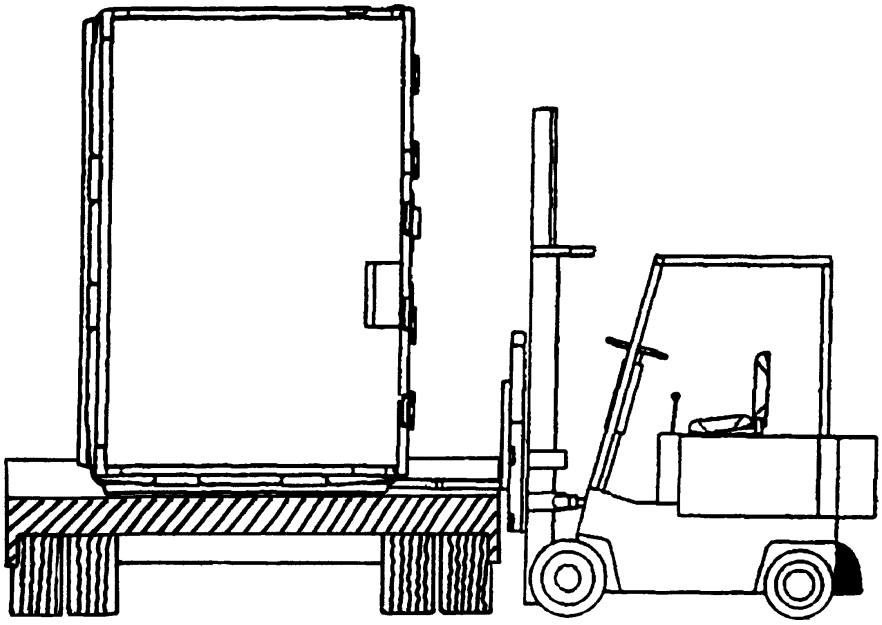

Figure B-2 Horizontal/Overland Transportation Configuration

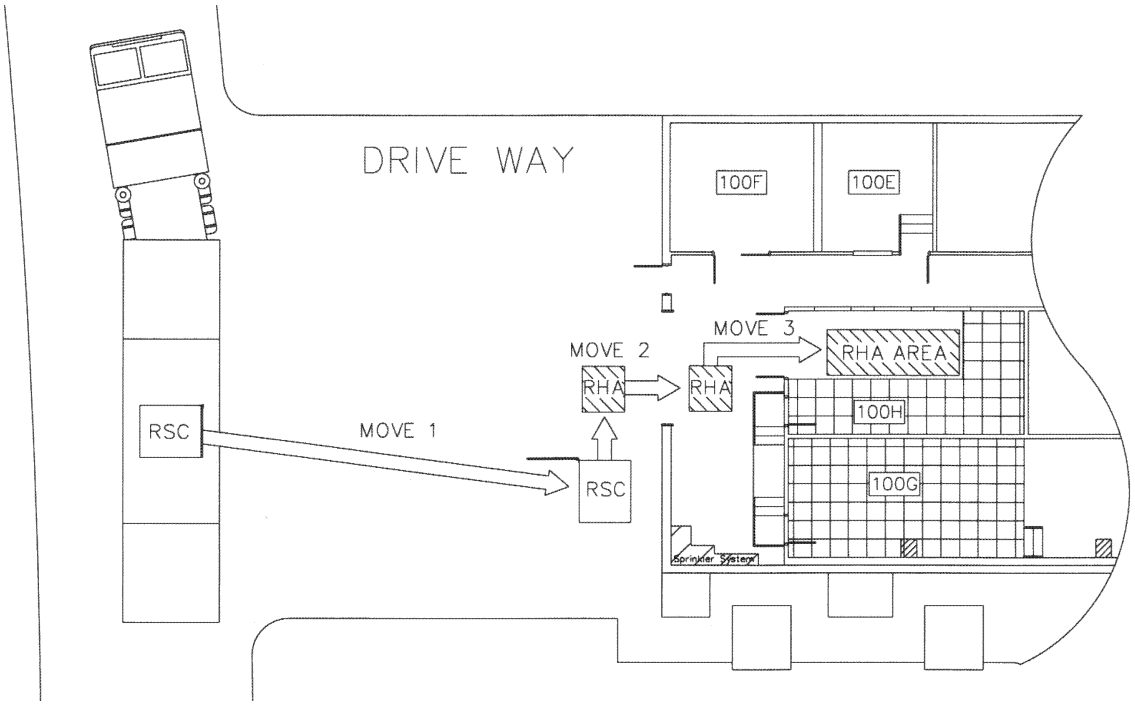

Figure B-3 RSC Receiving And Inspection

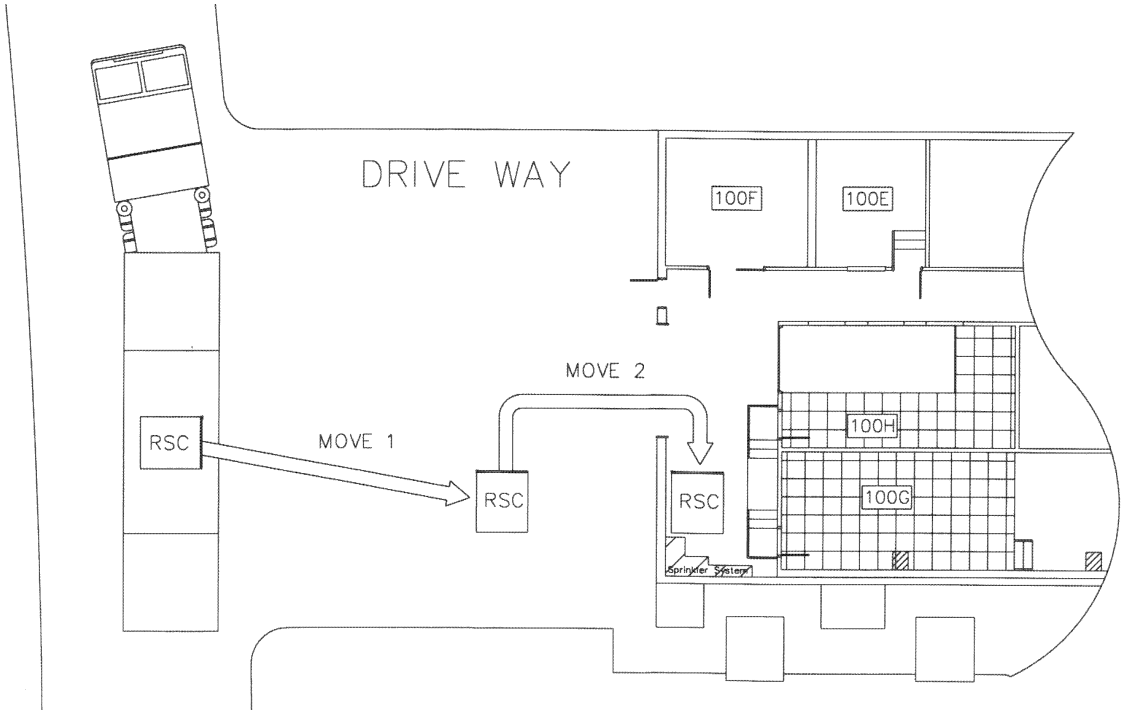

Figure B-4 Building 241 RSC Movement

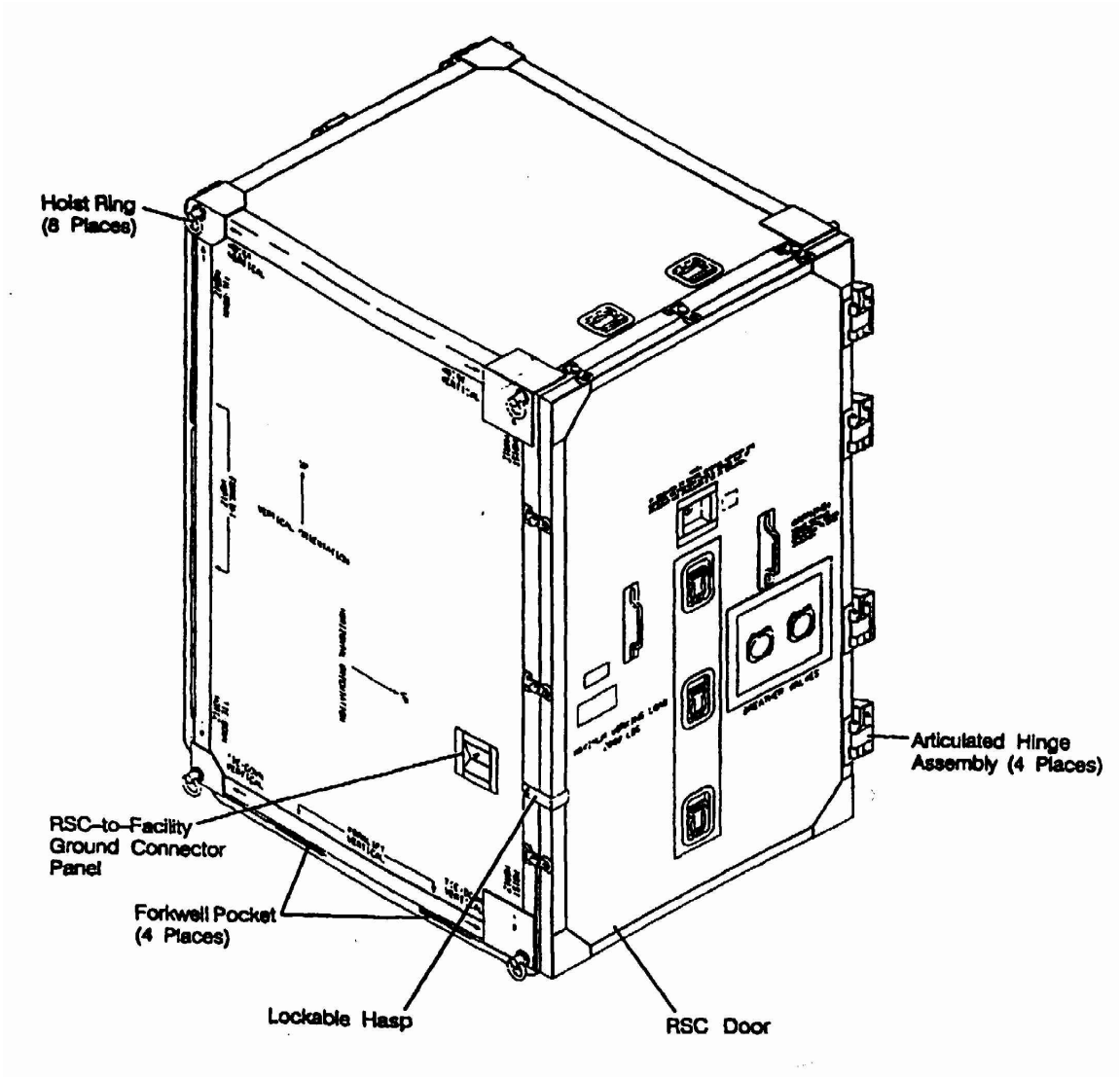

Figure B-5 Rack Shipping Container (GX1-01094) Configuration And Primary Components

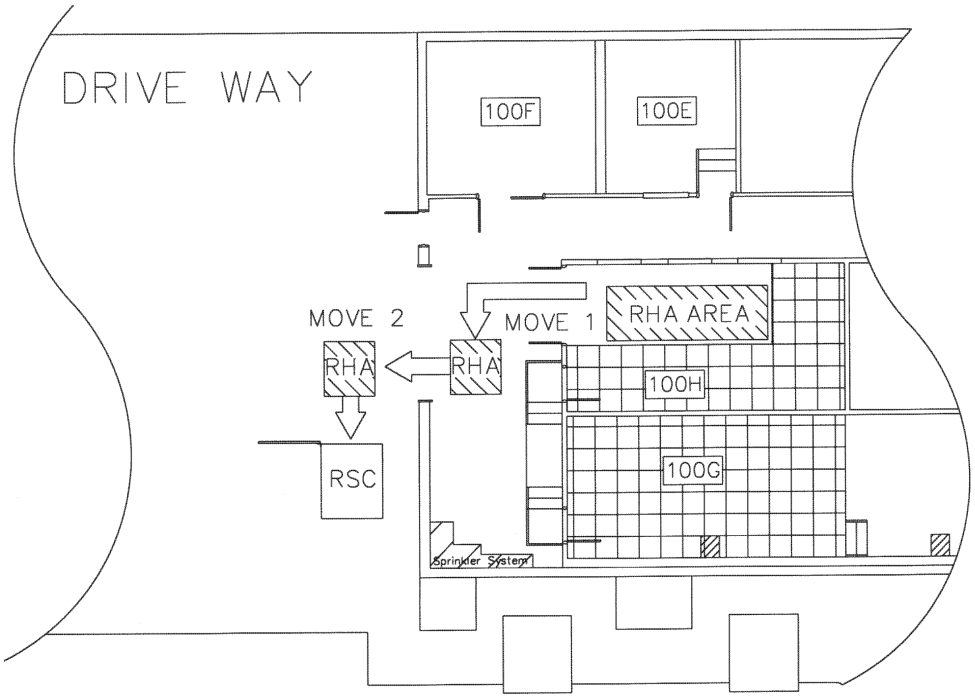

Figure B-6 RSC Unpacking Position

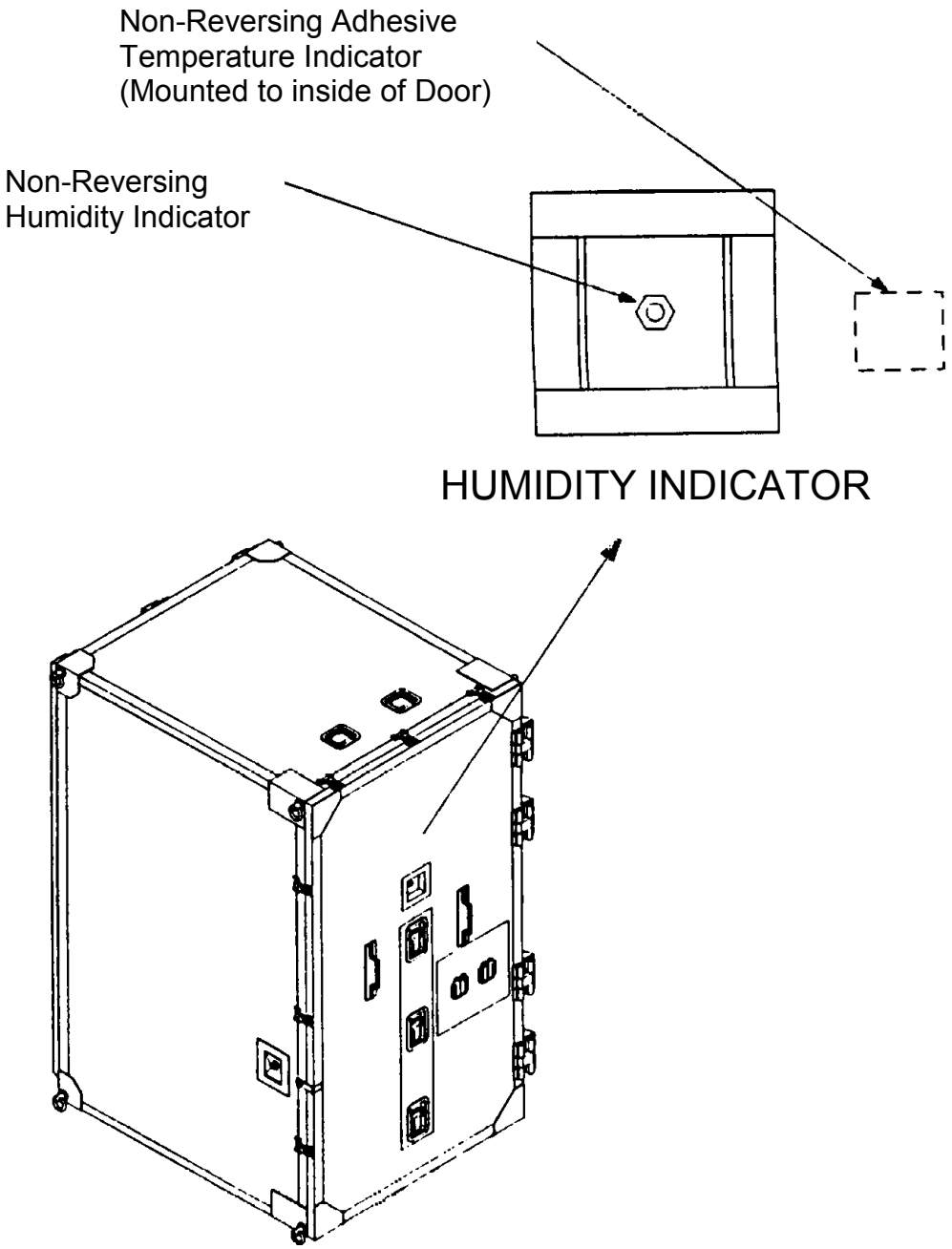

Figure B-7 RCS Humidity Indicator And RCS Temperature Indicator

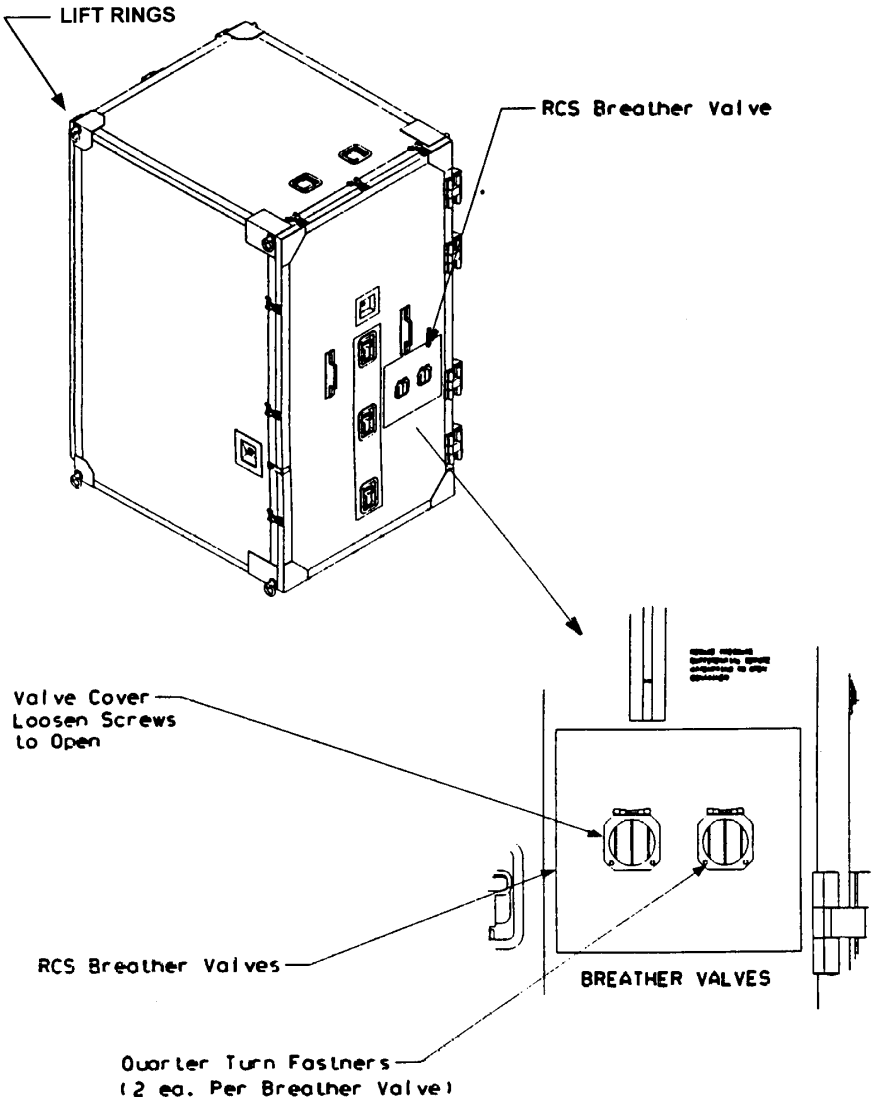

Figure B-8 RCS Breather Valve

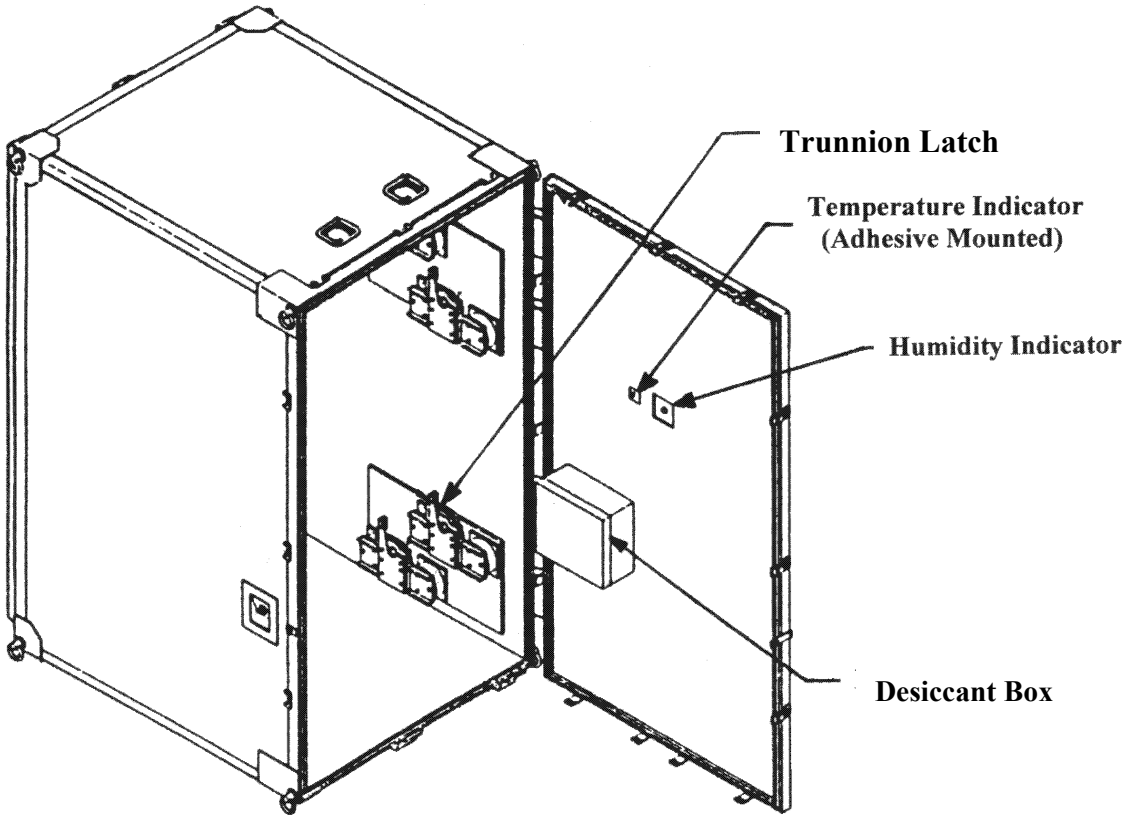

Figure B-9 RSC Temperature Indicator

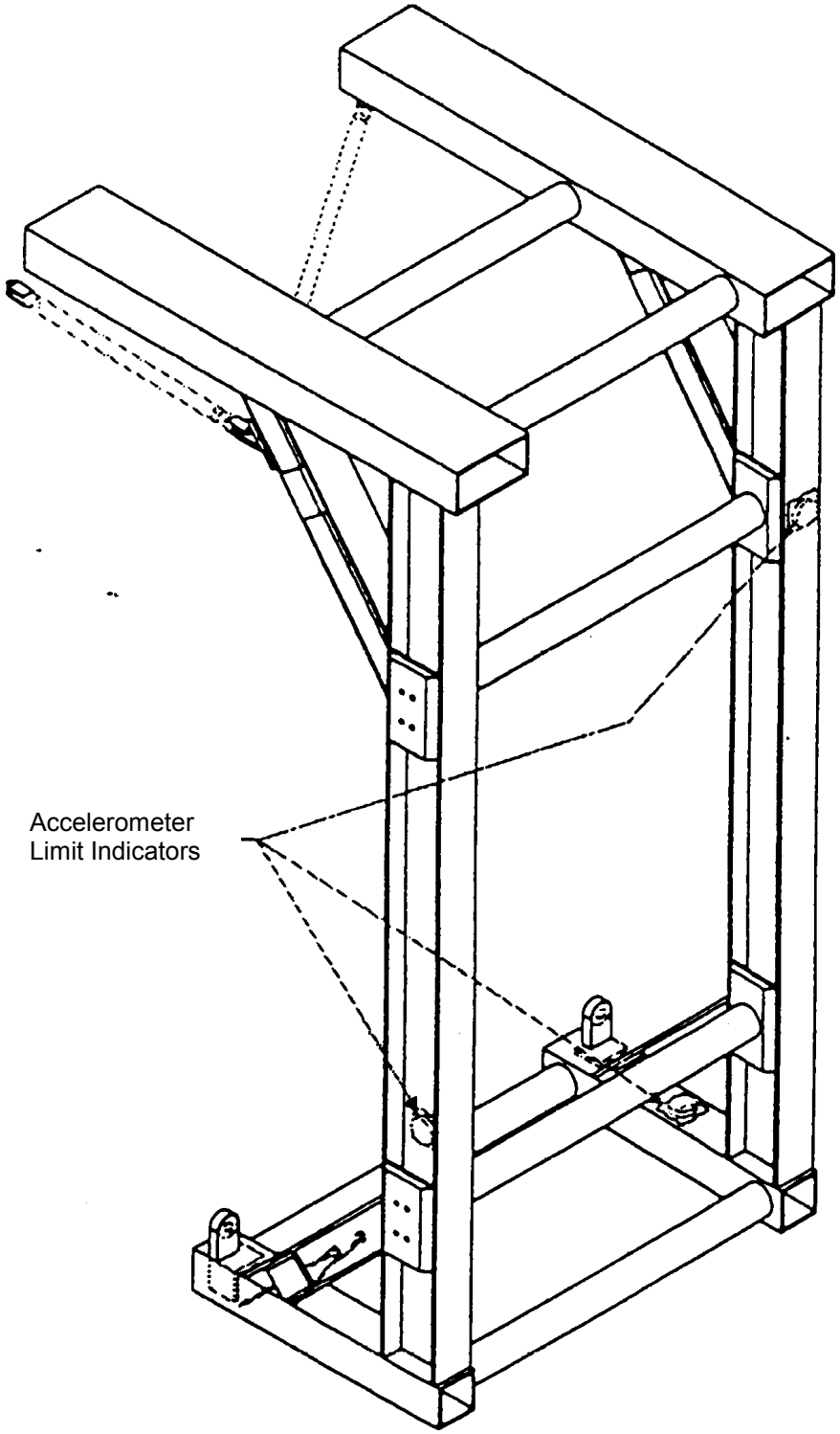

Figure B-10 Accelerometer Limit Indicator

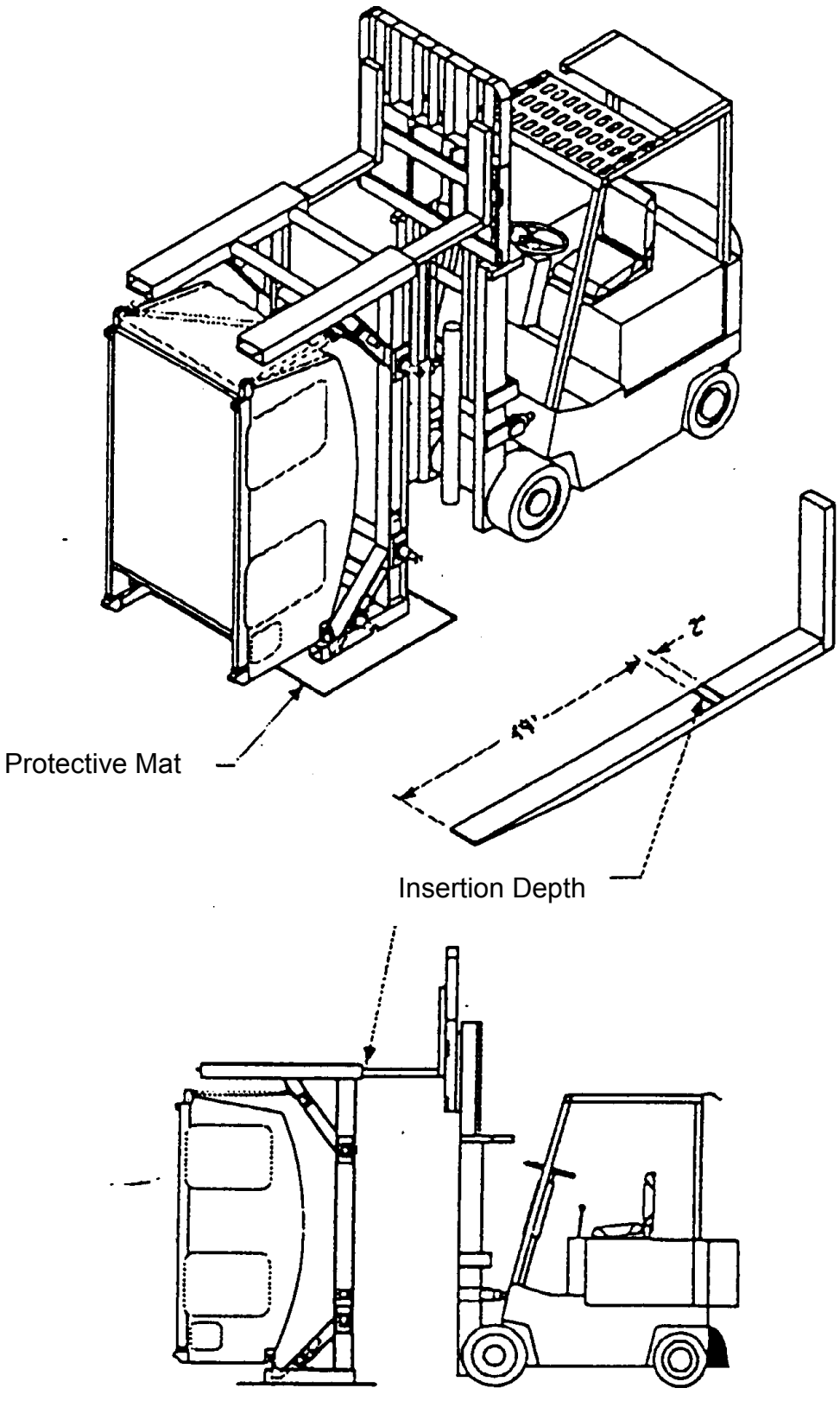

Figure B-11 RHA Fork Lift Configuration

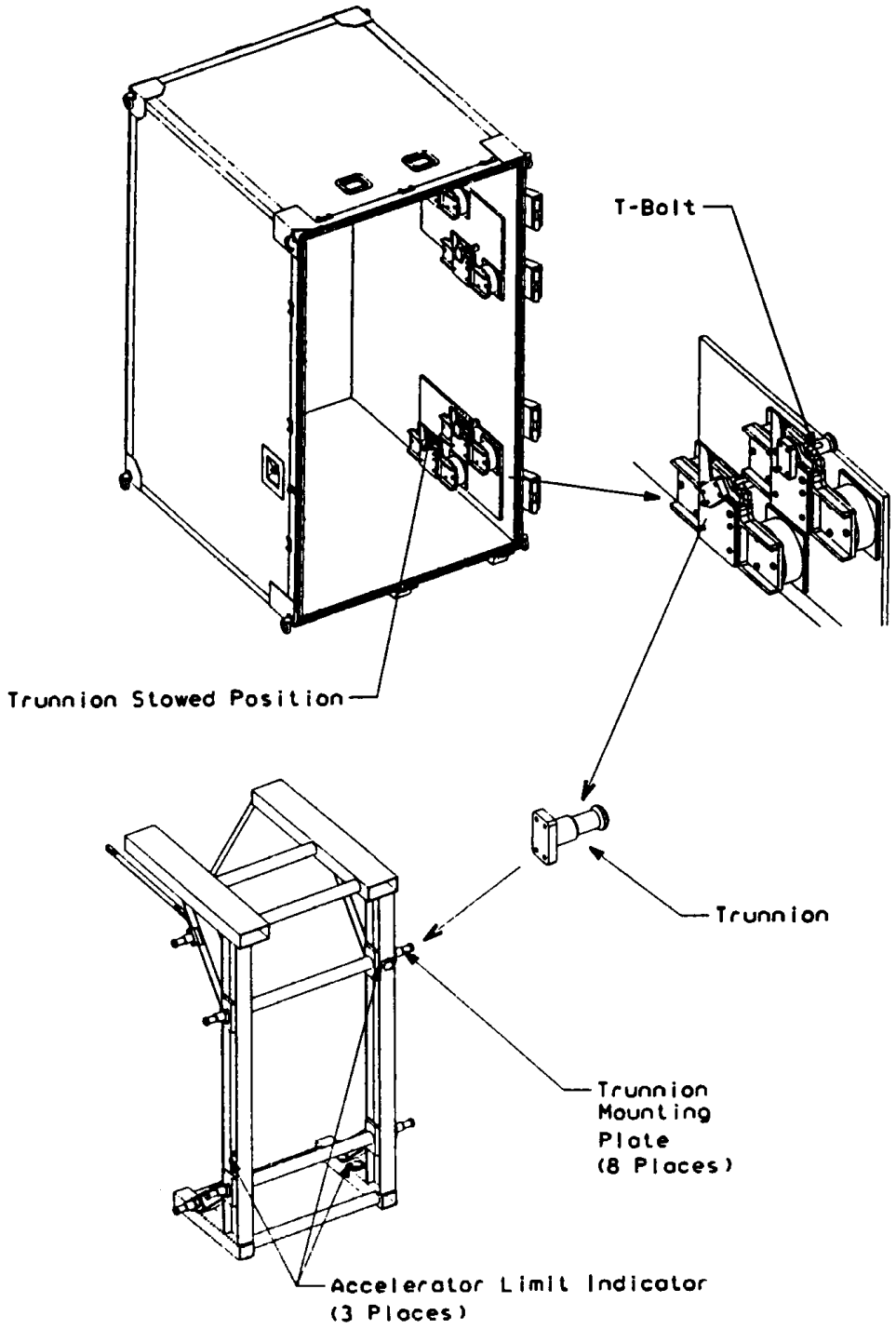

Figure B-12 RHA Trunnion Installation And Accelerator Limit Indicators

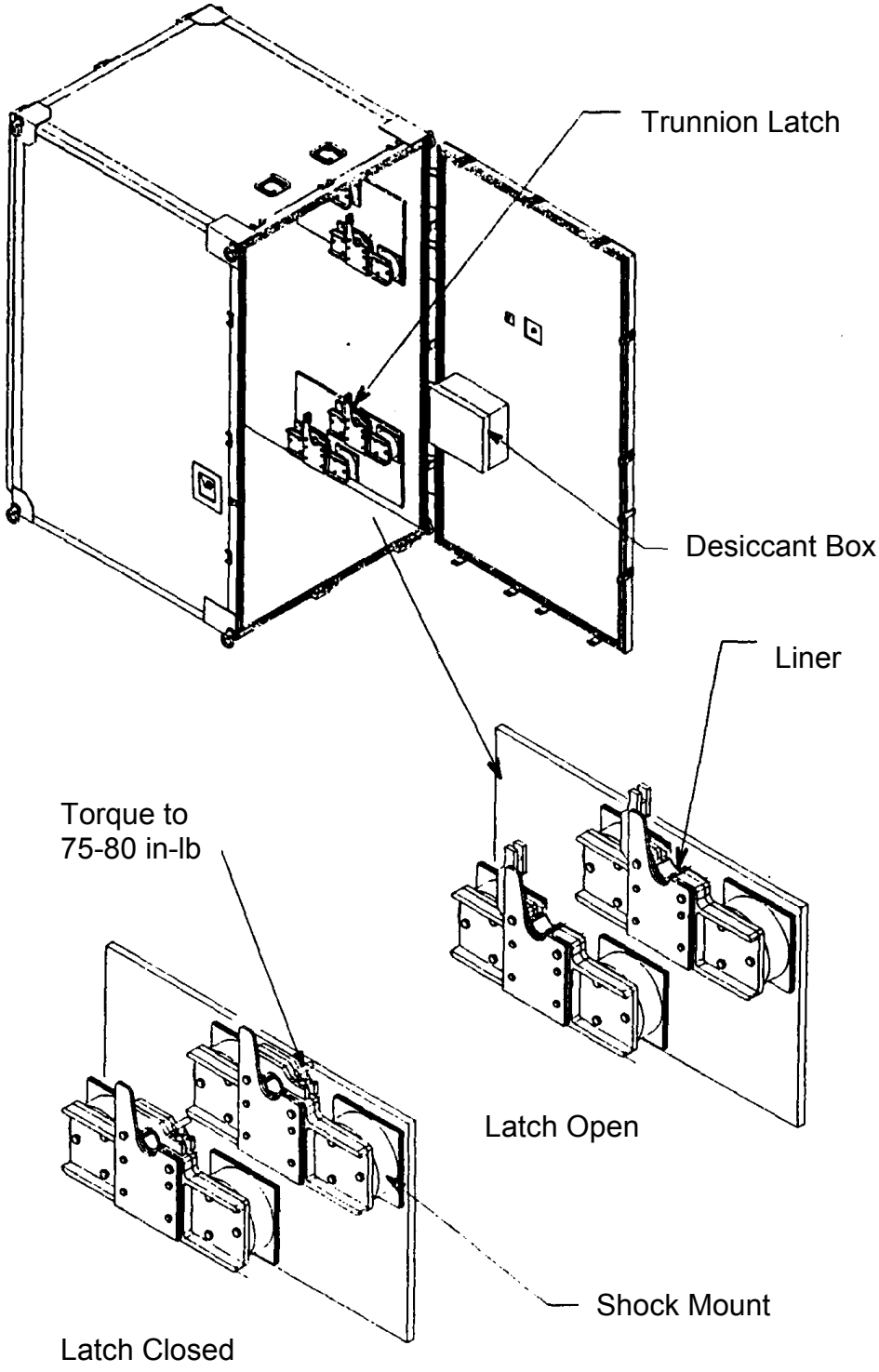

Figure B-13 RCS Trunnion Latch, Liner, Shock Mount And Desiccant Box

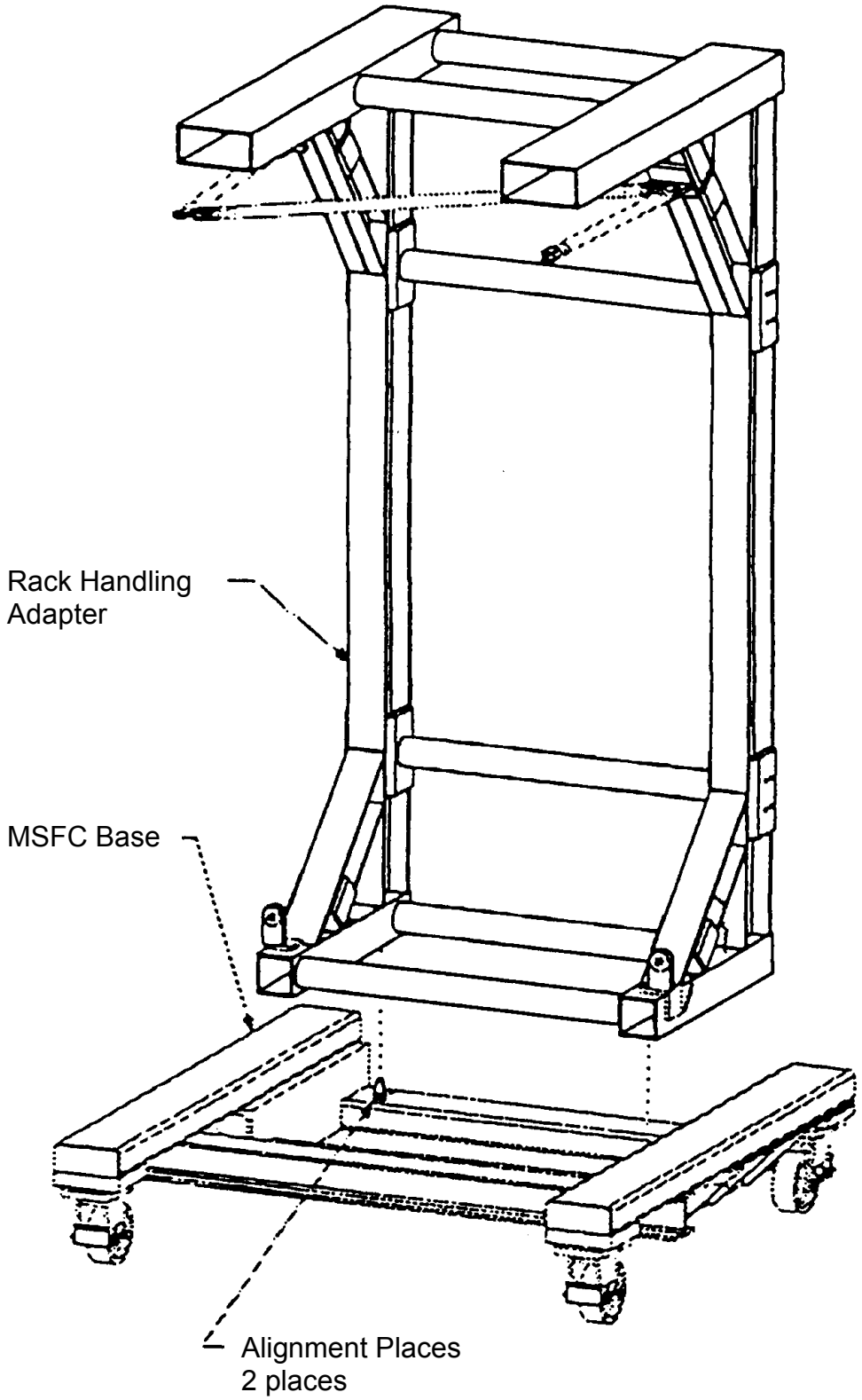

Figure B-14 Standard Rack Installation With MSFC Base Assembly

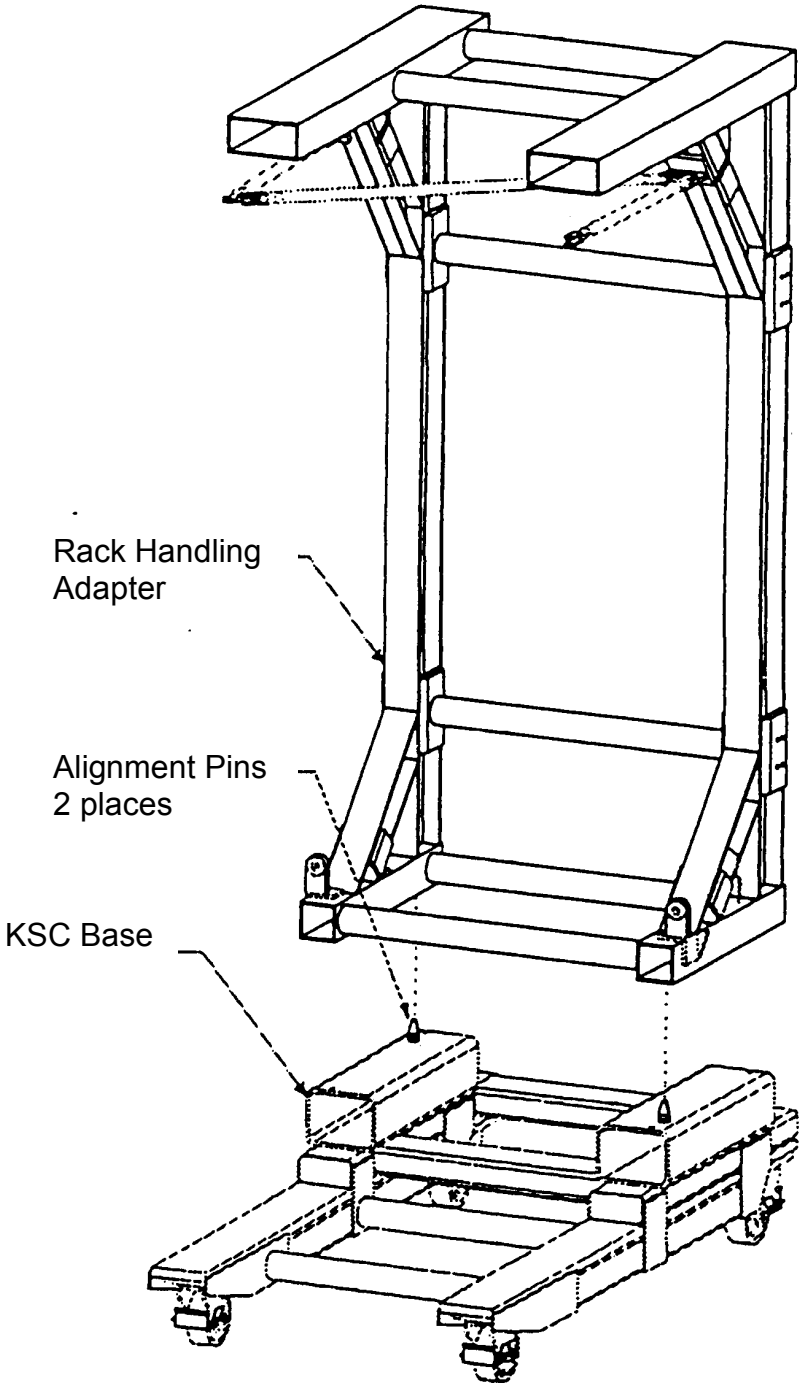

Figure B-15 Rack Installation With KSC Base

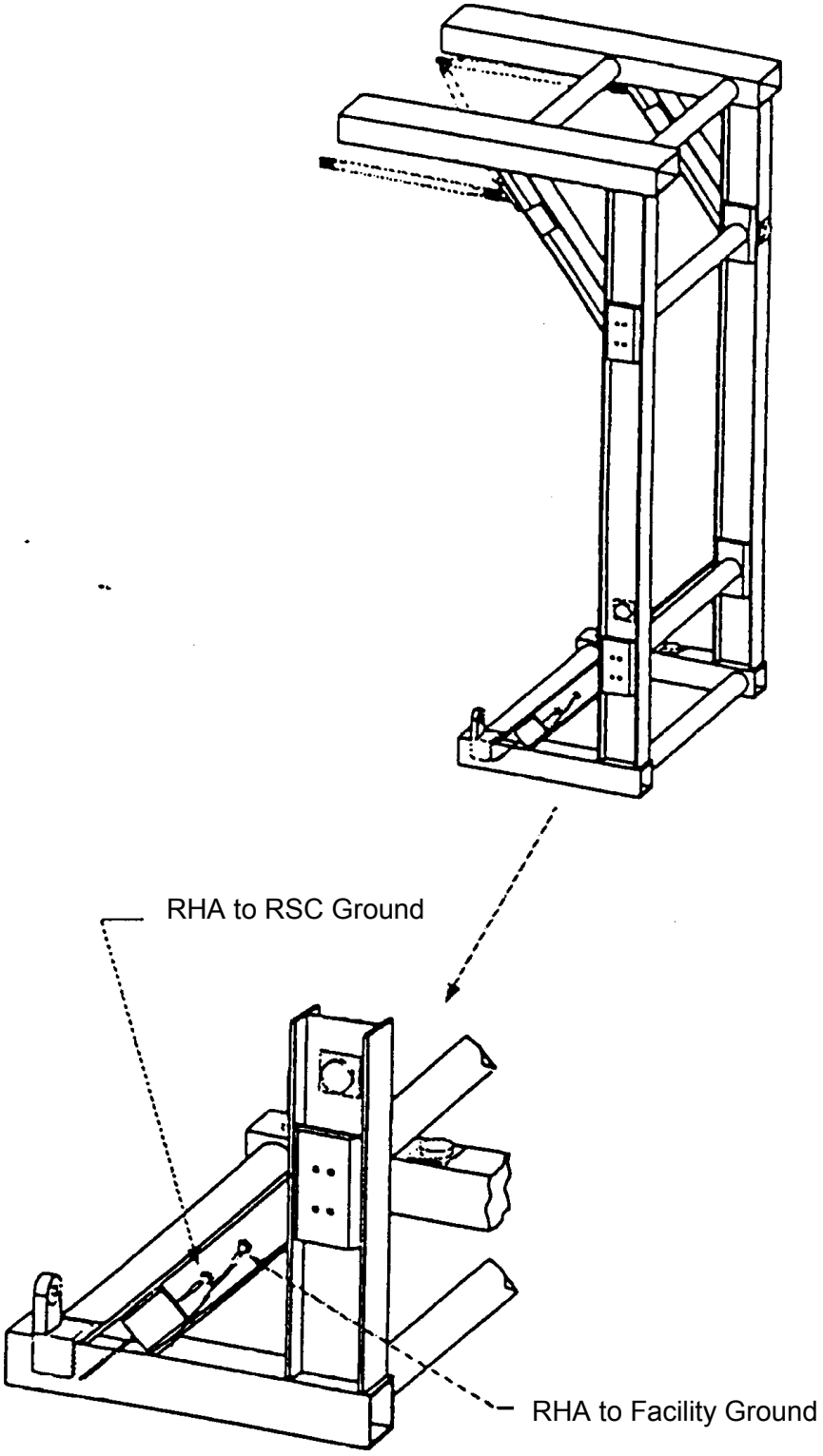

Figure B-16 RHA Grounding Configuration

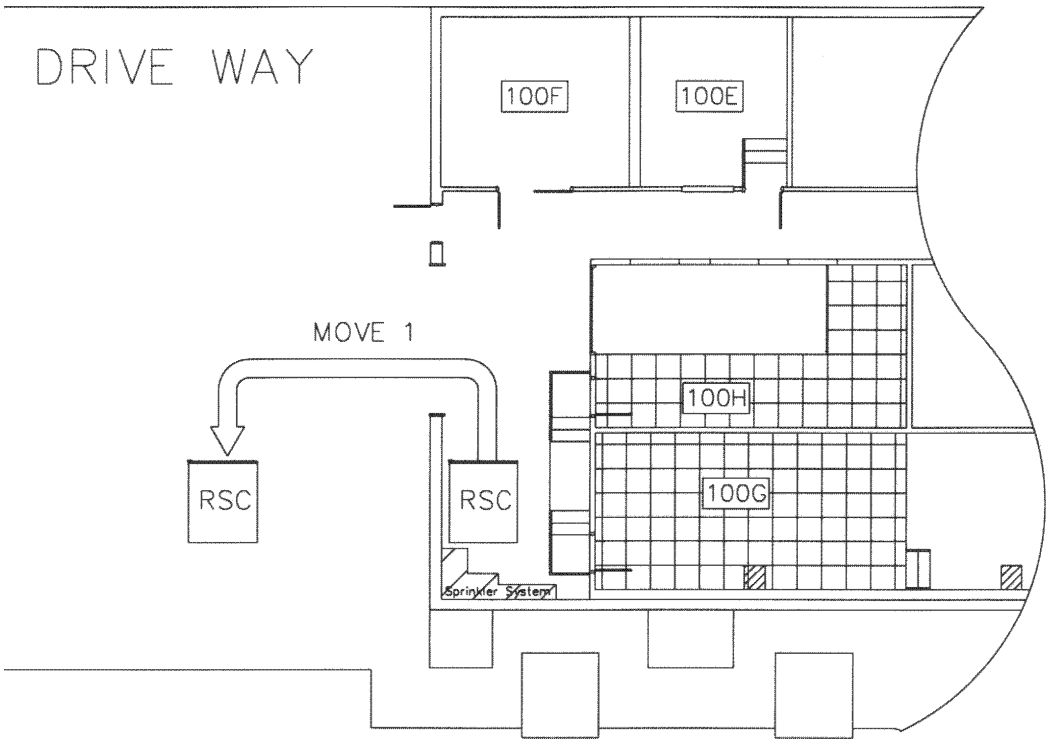

Figure B-17 RSC Movement From Building 241

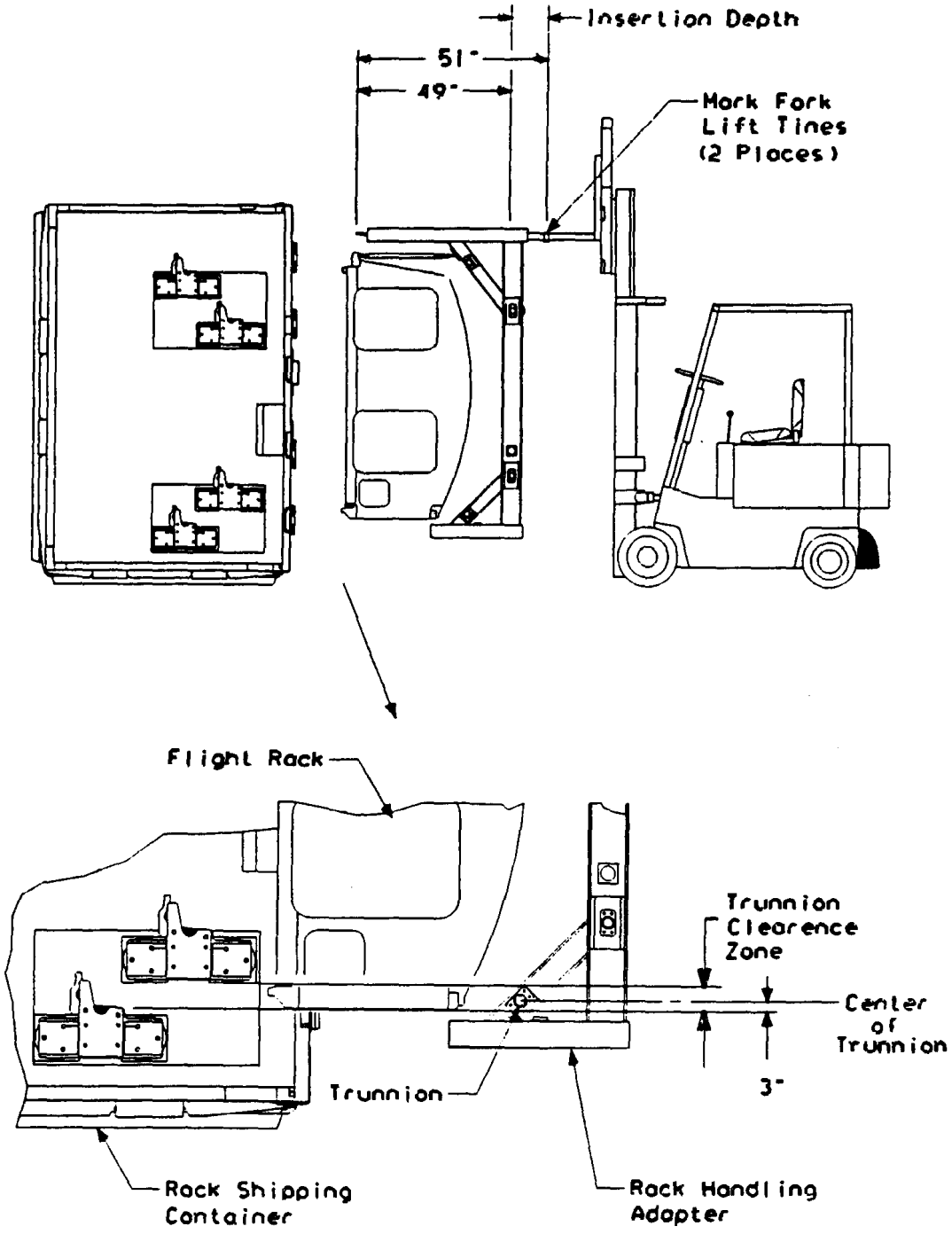

Figure B-18 RHA Installation/Removal With RSC

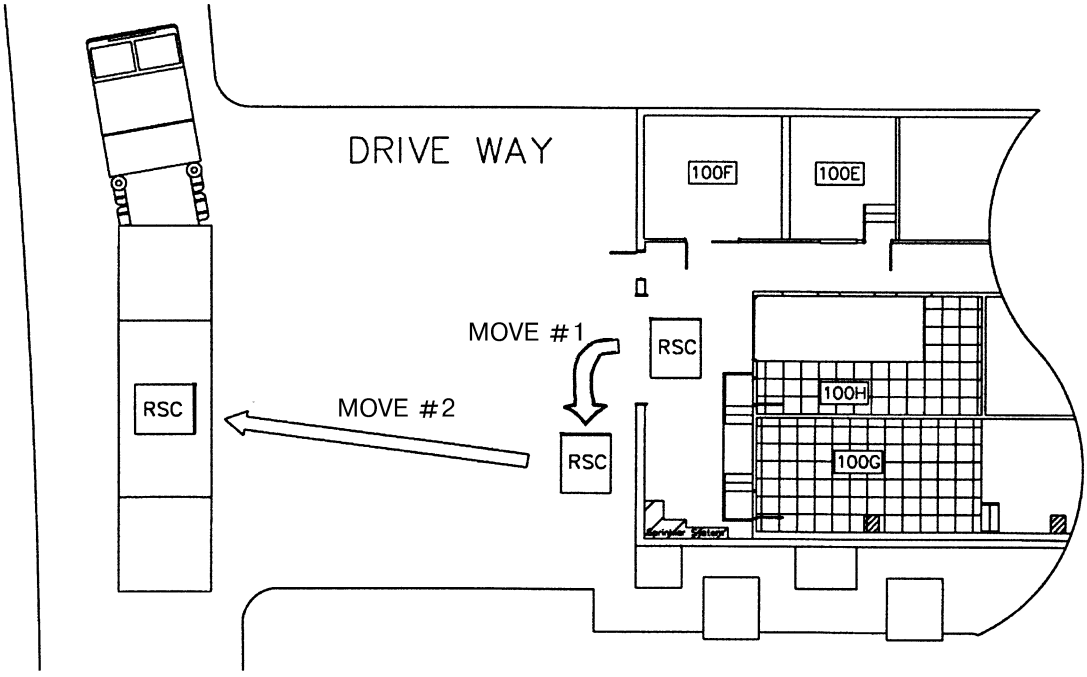

Figure B-19 Move RSC To Semi-Truck

DISTRIBUTION
FOR LS-71139-1A

NASA/JSC
EA5/L. Bauer
EA5/E. Strong
NT3/GFE Assurance Branch
SF/D. Grounds

LOCKHEED MARTIN
C20/G. Harvey
C42/M. Gerlach
C64/S. Fetzer
C64/R. Henneke
C64/D. Reed
C64/R. Trittipo
C64/T. Wiggins
S03/D. Babic
S03/P. Miller
S03/J. Searcy
S03/Science Payloads Library
S18/J. Hoge
S18/M. Klee
S18/G. Salinas
S22/D. Barineau
S22/S. Bhaskaran
S22/R. Ezell
S22/R. Gonzales
S22/K. Lajaunie
S22/T. Leger
S22/C. McGee
S22/S. Tarver
S22/M. Trenolone (3)
S22/K. Upham
S22/E. Witt
S361/J. McDonald
S362/STI Center/Bldg. 36 (3)
S56/G. Geissen